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Appendicies

Sales Creek, Revere X Graver
(Appendices to Addendum
To Prelim. DRAFT EIR)

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Environmental Review

APPENDICES

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Appendix B	Boring Logs
Appendix C	Water Quality Analyses and Field Data Notes
Appendix D	Bibliography
Appendix E	Common and Scientific Names of Plant Species
Appendix F	Common and Scientific Names of Wildlife Species
Appendix G	Results of Biological Sampling
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http://www.archive.org/details/draftenvironment1976camp

APPENDIX A - LIST OF PLATES

Plate 1	Sales Creek Watershed
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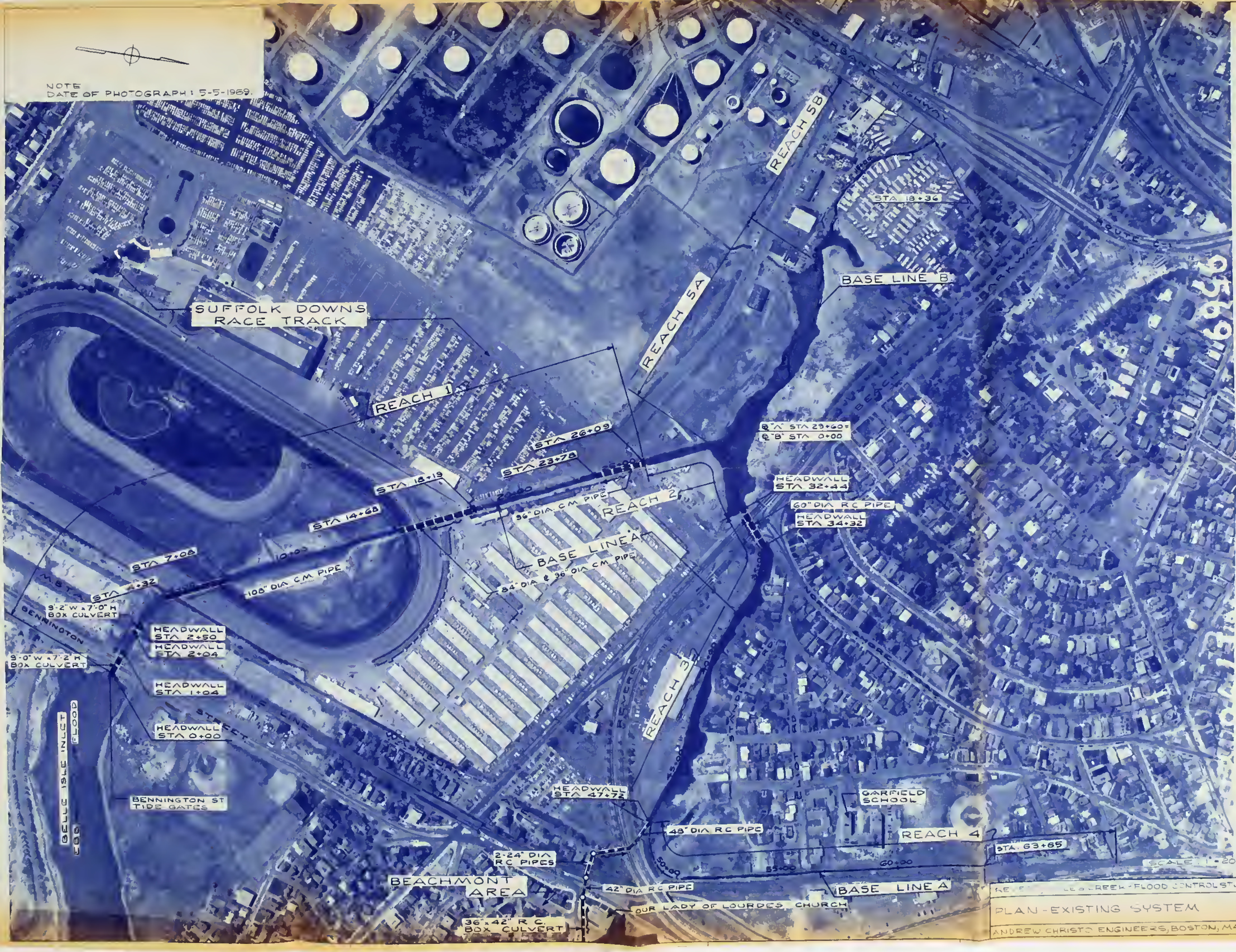
Plate 24	Profile - New System
Plate 25	Profile - New System
Plate 26	Profile - New System
Plate 27	Profile - New System
Plate 28	Cross Sections - New System
Plate A	Chelsea River Alternative



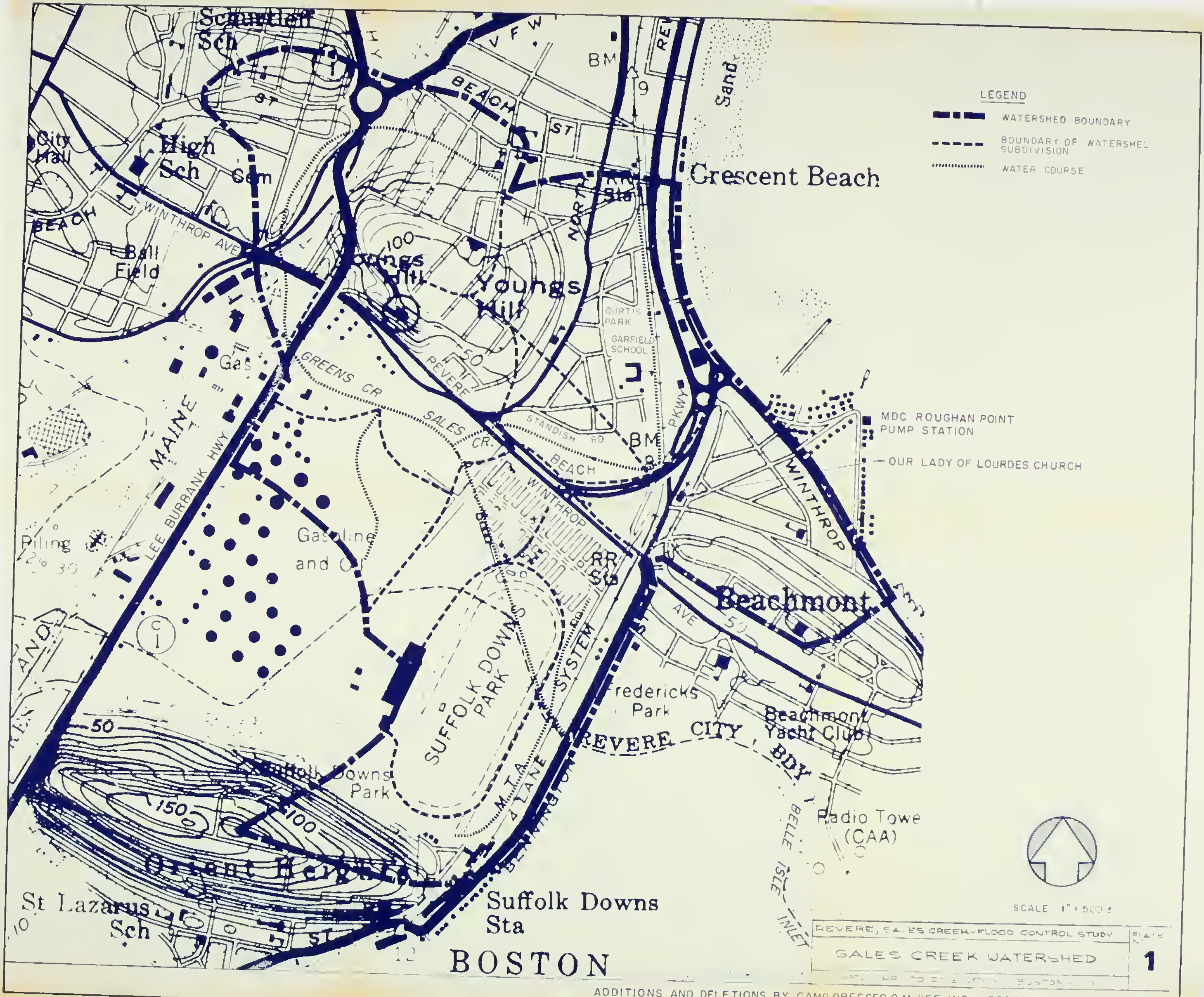
NOTE
DATE OF PHOTOGRAPH: 5-5-1969.

REVERE - SALES CREEK - FLOOD CONTROL STUDY

PLAN - EXISTING SYSTEM

ANDREW CHRISTO ENGINEERS, BOSTON, MASS.

PLATE NO 2

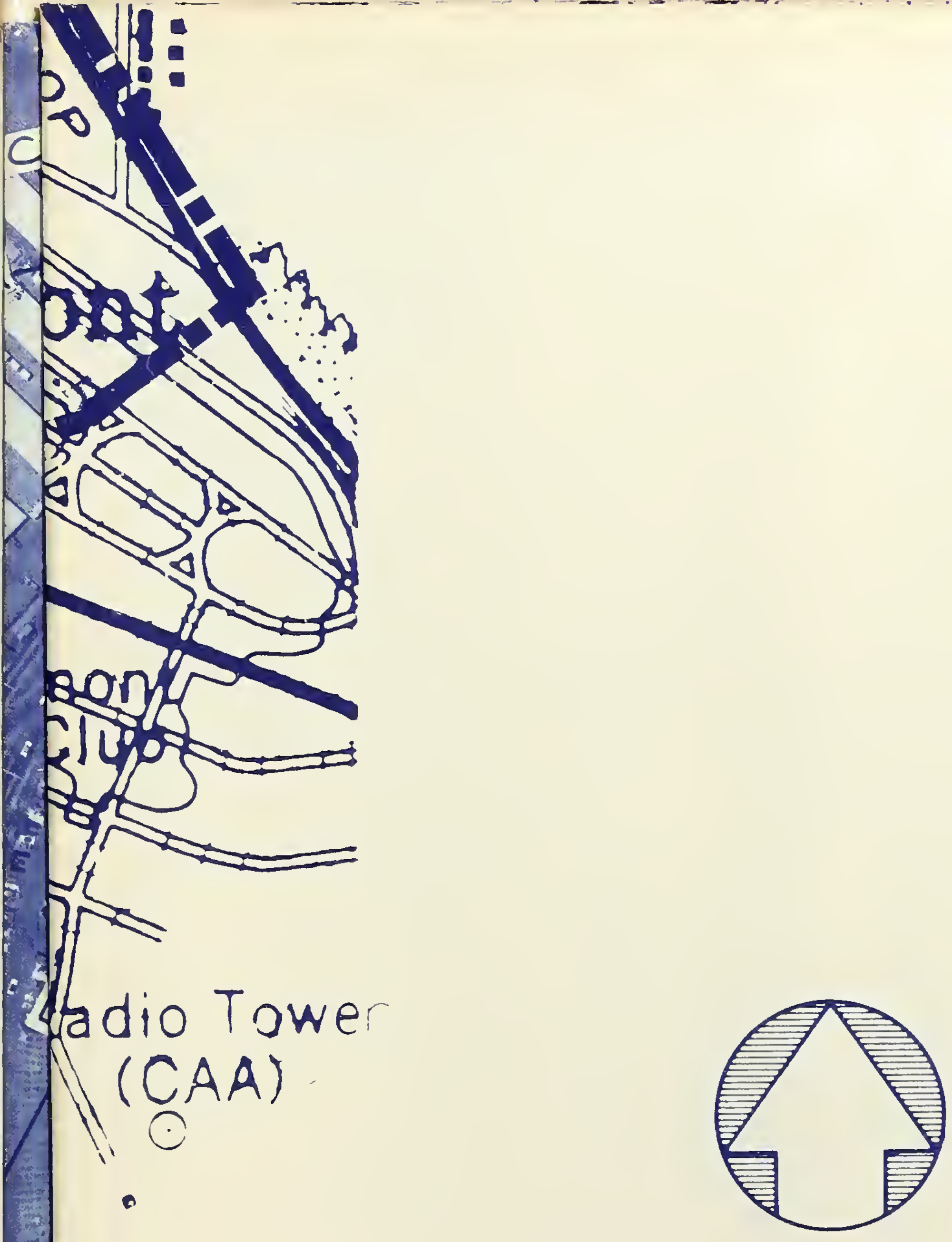


REVERE, SALES CREEK-FLOOD CONTROL STUDY

SALES CREEK WATERSHED

PLATE No. 1

ADDITIONS AND DELETIONS BY CAMP DRESSER & McKEE INC., BOSTON MASS. NOVEMBER 1976



SCALE : 1" = 500'±

EVERE, SALES CREEK-FLOOD CONTROL STUDY

PLATE NO. **1**

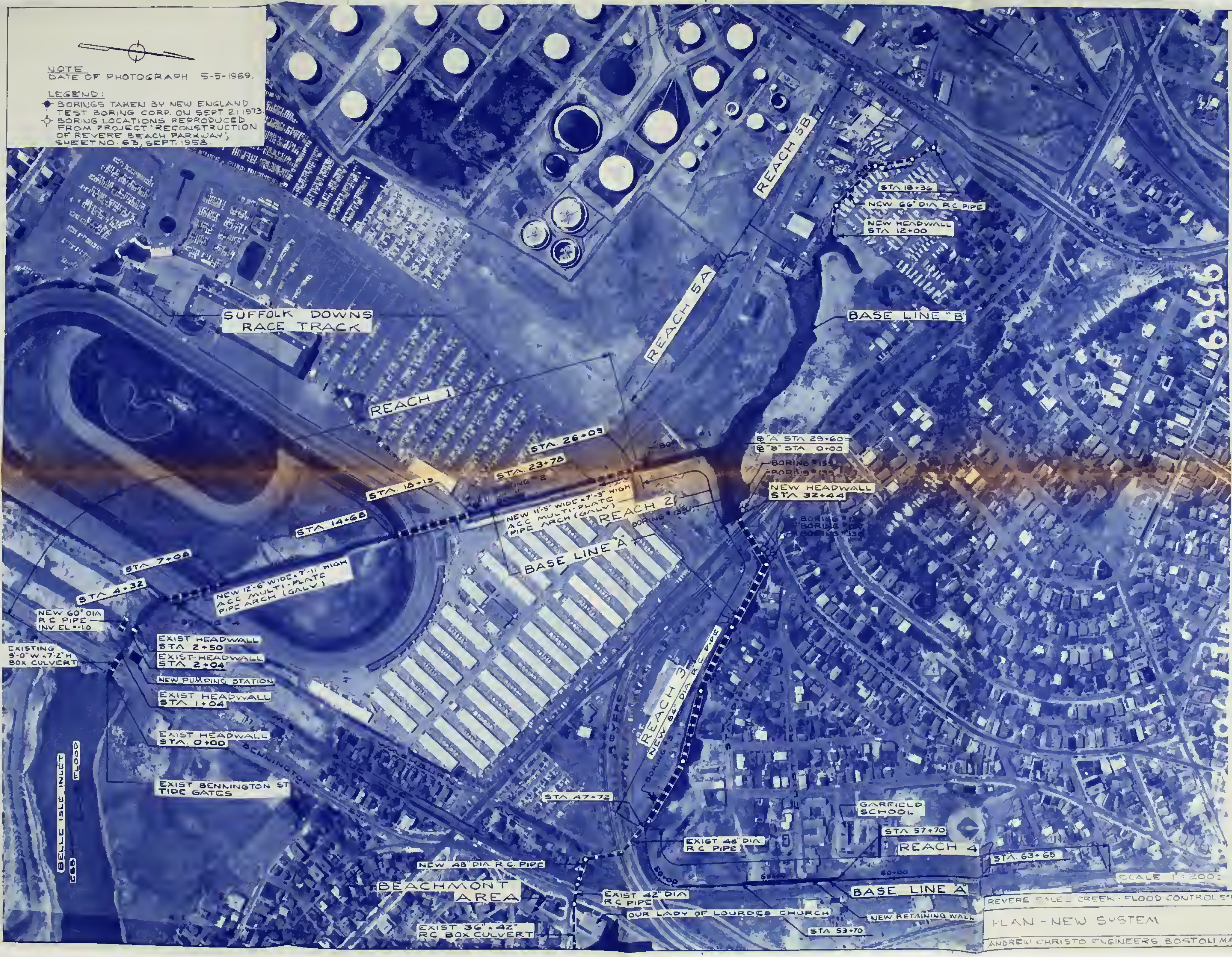
SALES CREEK WATERSHED

NDREW CHRISTO ENGINEERS, BOSTON, MASS.

P DRESSER & McKEE INC., BOSTON MASS. NOVEMBER 1976

NOTE
DATE OF PHOTOGRAPH 5-5-1969.

LEGEND:
- ◆ BORINGS TAKEN BY NEW ENGLAND TEST BORING CORP. ON SEPT 21 1973.
- ⌖ BORING LOCATIONS REPRODUCED FROM PROJECT 'RECONSTRUCTION OF REVERE BEACH PARKWAY', SHEET NO. 63, SEPT. 1958.

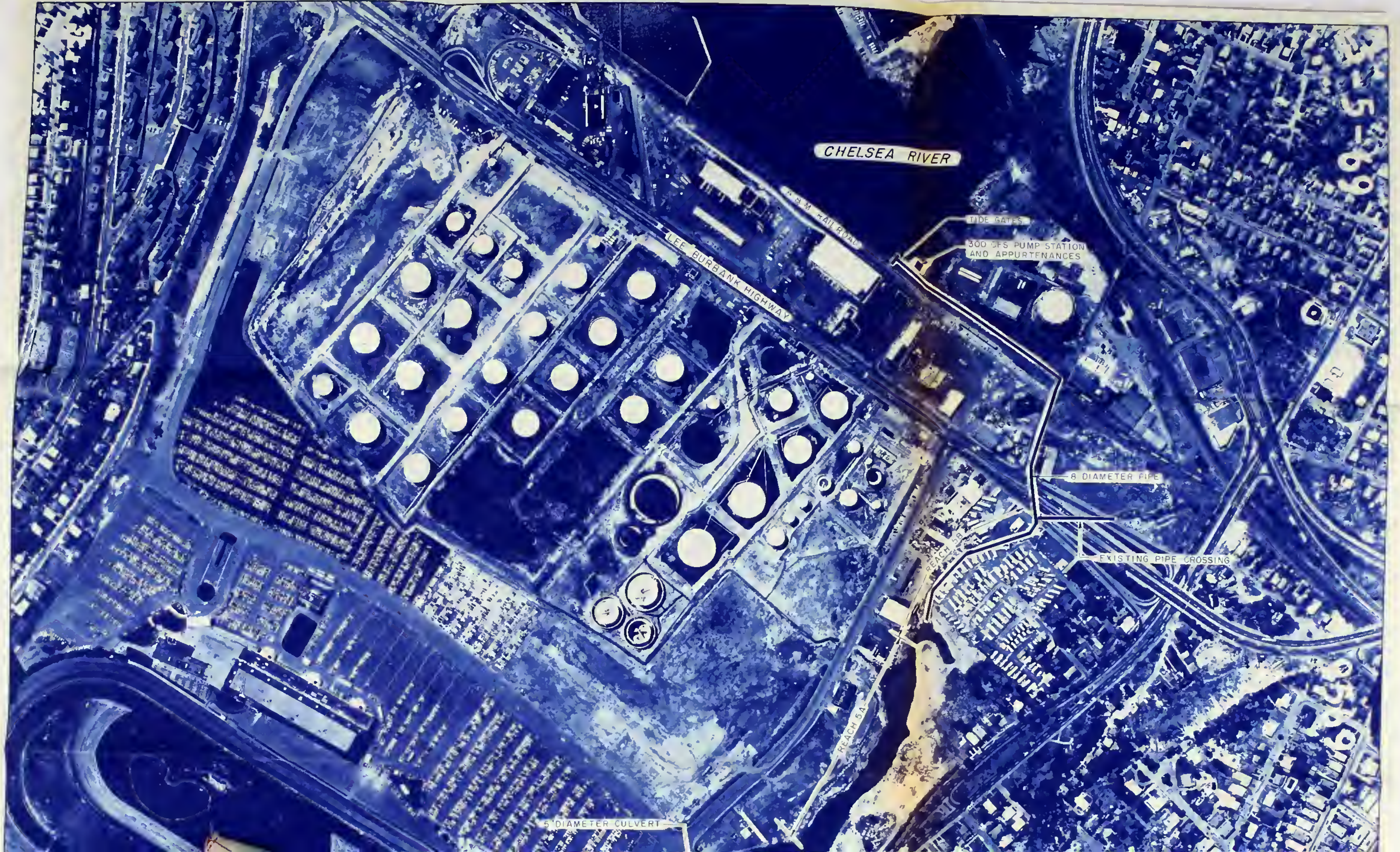


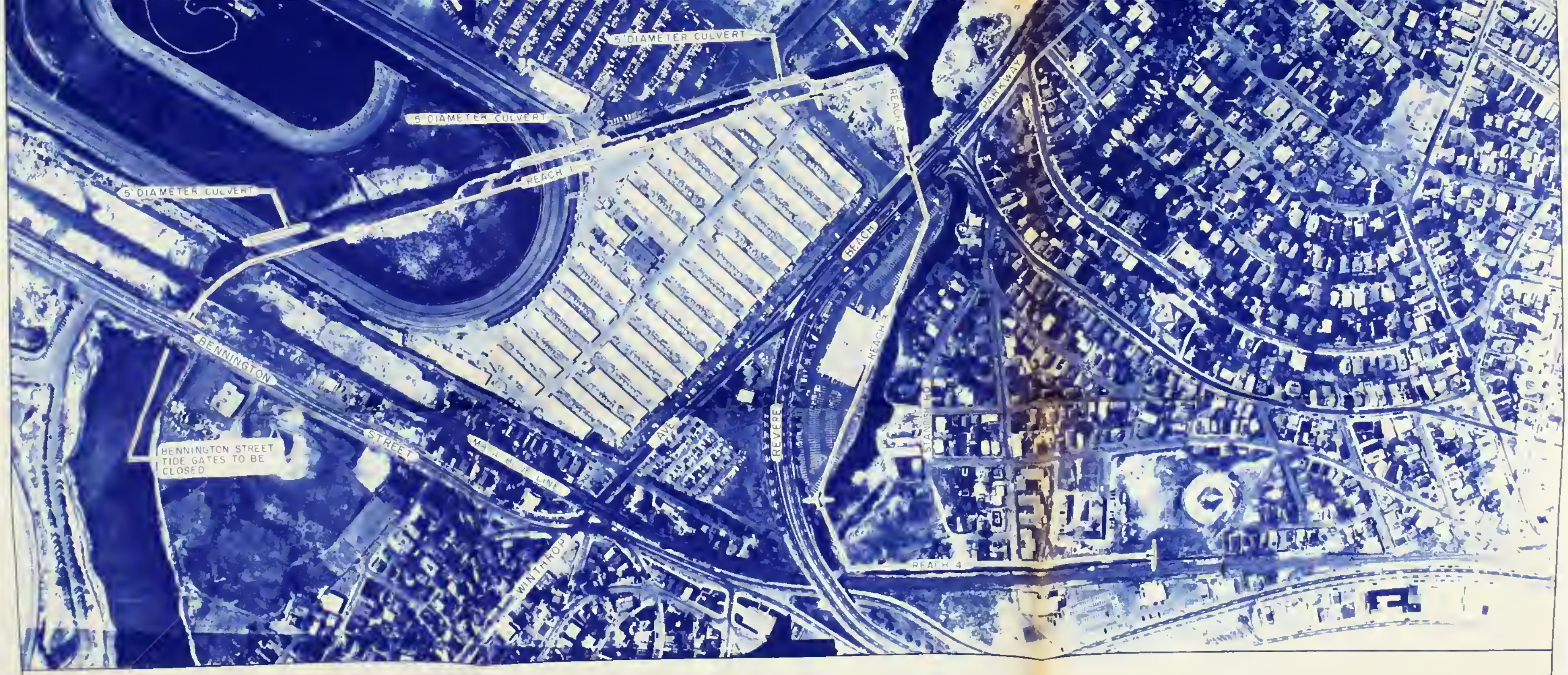
REVERE SALES CREEK · FLOOD CONTROL STUDY

PLAN - NEW SYSTEM

ANDREW CHRISTO ENGINEERS BOSTON MASS.

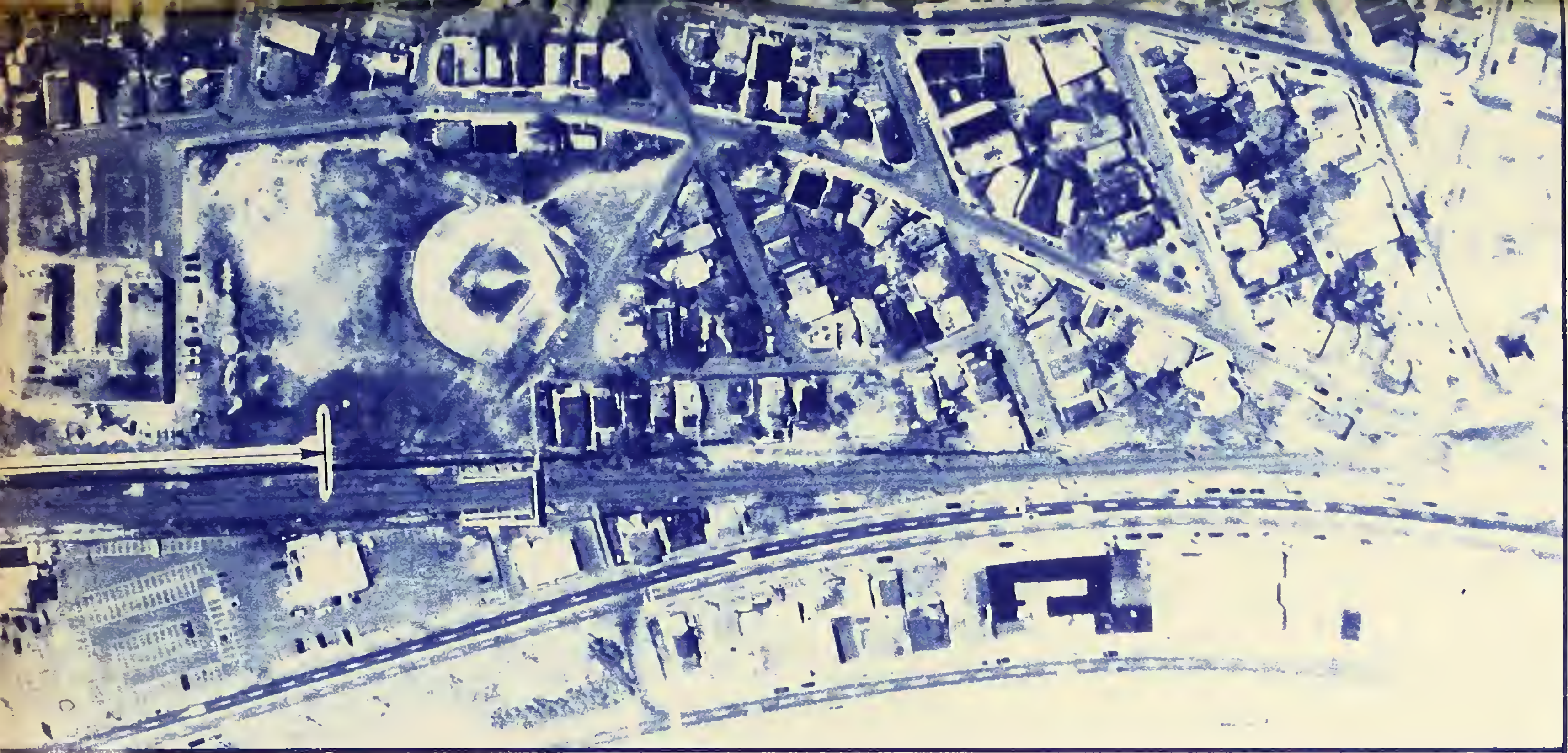
PLATE NO
22


CHELSEA RIVER
B&M RAILROAD
LEE BURBANK HIGHWAY
TIDE GATES
300 CFS PUMP STATION AND APPURTENANCES
8' DIAMETER PIPE
EXISTING PIPE CROSSING
REACH 5B
REACH 5A
5' DIAMETER CULVERT
5-69



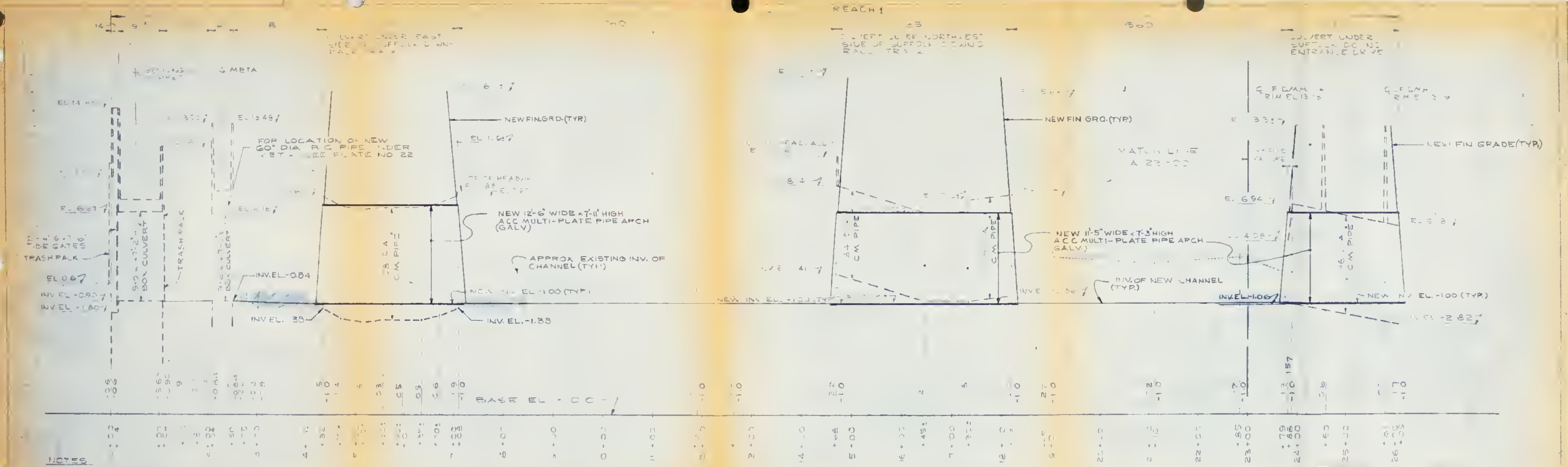
COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING
DIVISION OF WATERWAYS
ENVIRONMENTAL IMPACT REPORT • SALES CREEK • REVERE, MASSACHUSETTS

PLATE A CHELSEA RIVER ALTERNATIVE



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING
DIVISION OF WATERWAYS
ENVIRONMENTAL IMPACT REPORT • SALES CREEK • REVERE, MASSACHUSETTS

PLATE A CHELSEA RIVER ALTERNATIVE


REACH 1
CULVERT UNDER EAST SIDE OF SUFFOLK DOWNS RACE TRACK
CULVERT UNDER NORTHWEST SIDE OF SUFFOLK DOWNS RACE TRACK
CULVERT UNDER SUFFOLK DOWNS ENTRANCE DRIVE
NEW FIN.GRD.(TYP.)
NEW FIN GRD.(TYP.)
NEW FIN GRADE(TYP.)
FOR LOCATION OF NEW 60" DIA. R.C. PIPE UNDER ... SEE PLATE NO. 22
NEW 12'-6" WIDE x 7'-11" HIGH ACC MULTI-PLATE PIPE ARCH (GALV.)
APPROX. EXISTING INV. OF CHANNEL (TYP.)
NEW 11'-5" WIDE x 7'-3" HIGH A.C.C. MULTI-PLATE PIPE ARCH (GALV.)
INV. OF NEW CHANNEL (TYP.)
NEW INV. EL. -1.00 (TYP.)
INV. EL. -0.84
INV. EL. -1.33
INV. EL. -1.06
INV. EL. -0.90
INV. EL. -1.60
EL 0.67
2-4'6"x7'0" TIDE GATES
TRASH RACK
BOX CULVERT
C.M. PIPE
MATCH LINE A 22+00
EL. 6.94
BASE EL.

NOTES

1) DATUM BOSTON CITY BASE

2) FOR SURVEY INFORMATION SEE DIVISION OF WATERWAYS NOTES [illegible]

PROFILE

SCALE HOR. 1"=100'

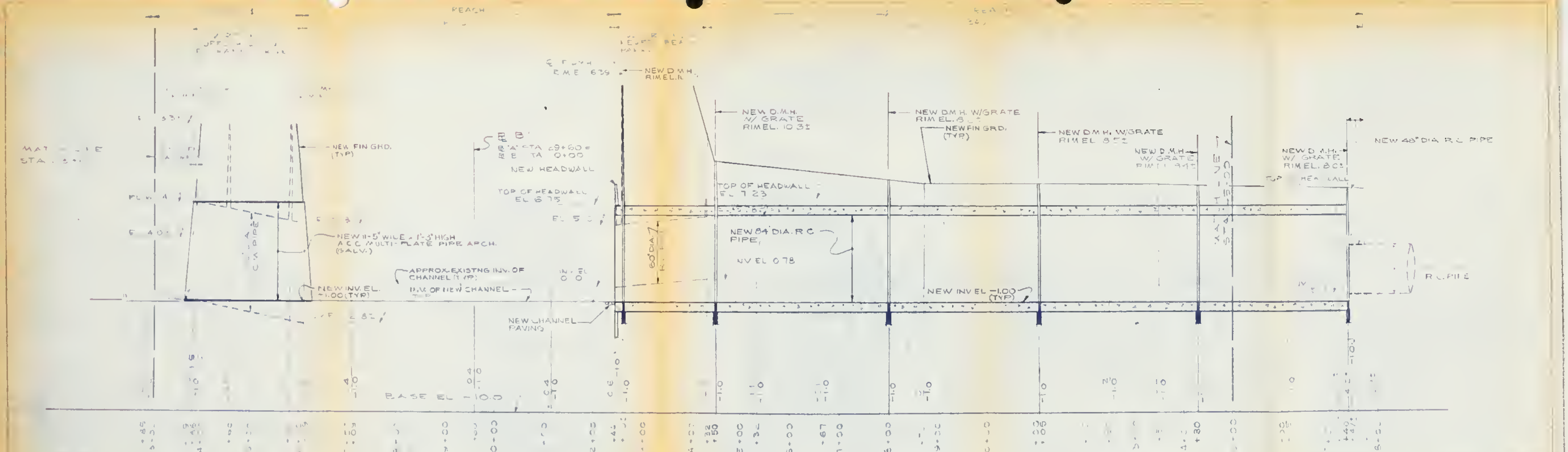
VERT. 1"=4'

REVERE, SALES CREEK - FLOOD CONTROL STUDY

PROFILE - NEW SYSTEM

ANDREW CHRISTO ENGINEERS, BOSTON, MASS.

PLATE NO. **24**



NOTES

1) DATUM BOSTON CITY BASE
2) FOR SURVEY INFORMATION SEE DIVISION OF WATERWAYS NOTEBOOK [illegible]

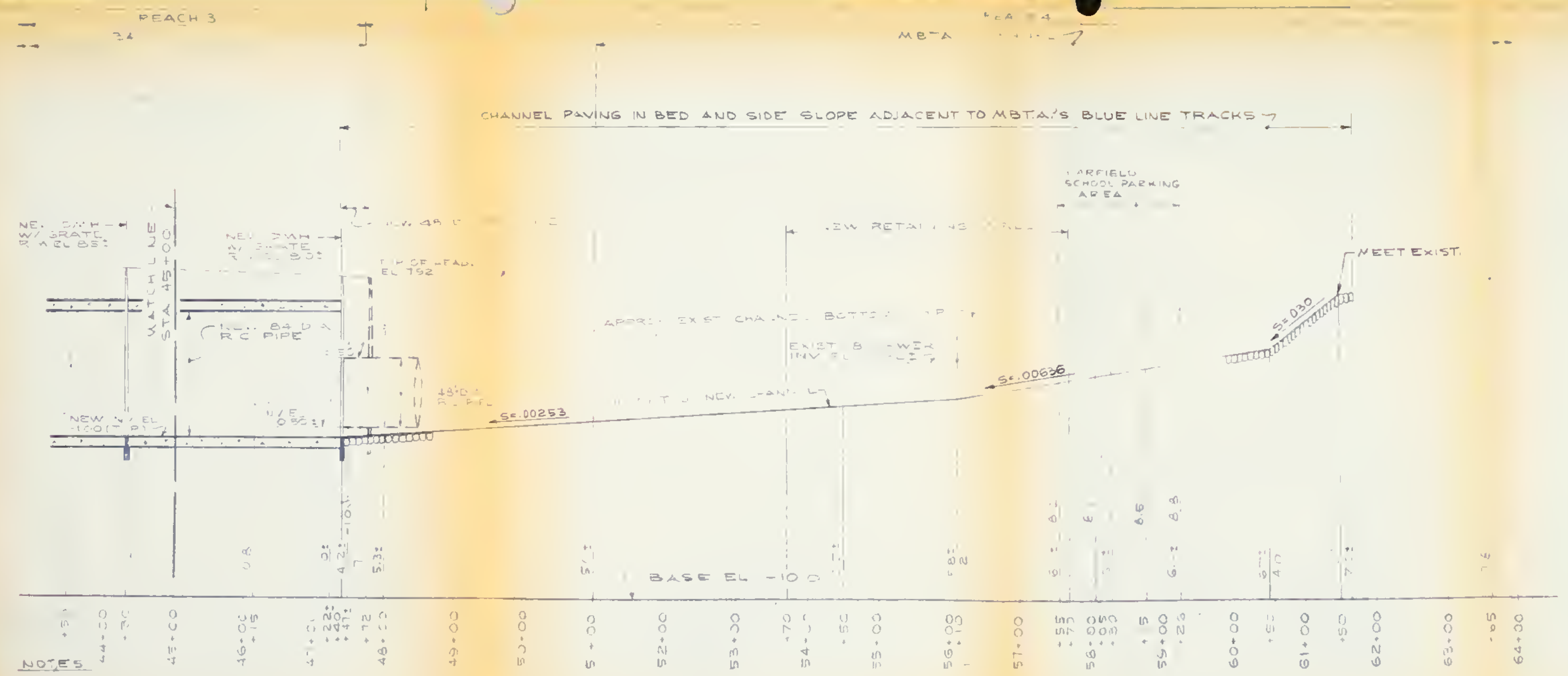
PROFILE - B-A
SCALE HOR 1"=100'
VERT 1"=4'

REVERE, SALES CREEK-FLOOD CONTROL STUDY

PROFILE - NEW SYSTEM

ANDREW CHRISTO ENGINEERS, BOSTON, MASS.

PLATE NO 25



NOTES
1) DATUM. BOSTON CITY BASE
2) FOR SURVEY INFORMATION SEE DIVISION OF WATERWAYS NOTEBOOK NO. 1119

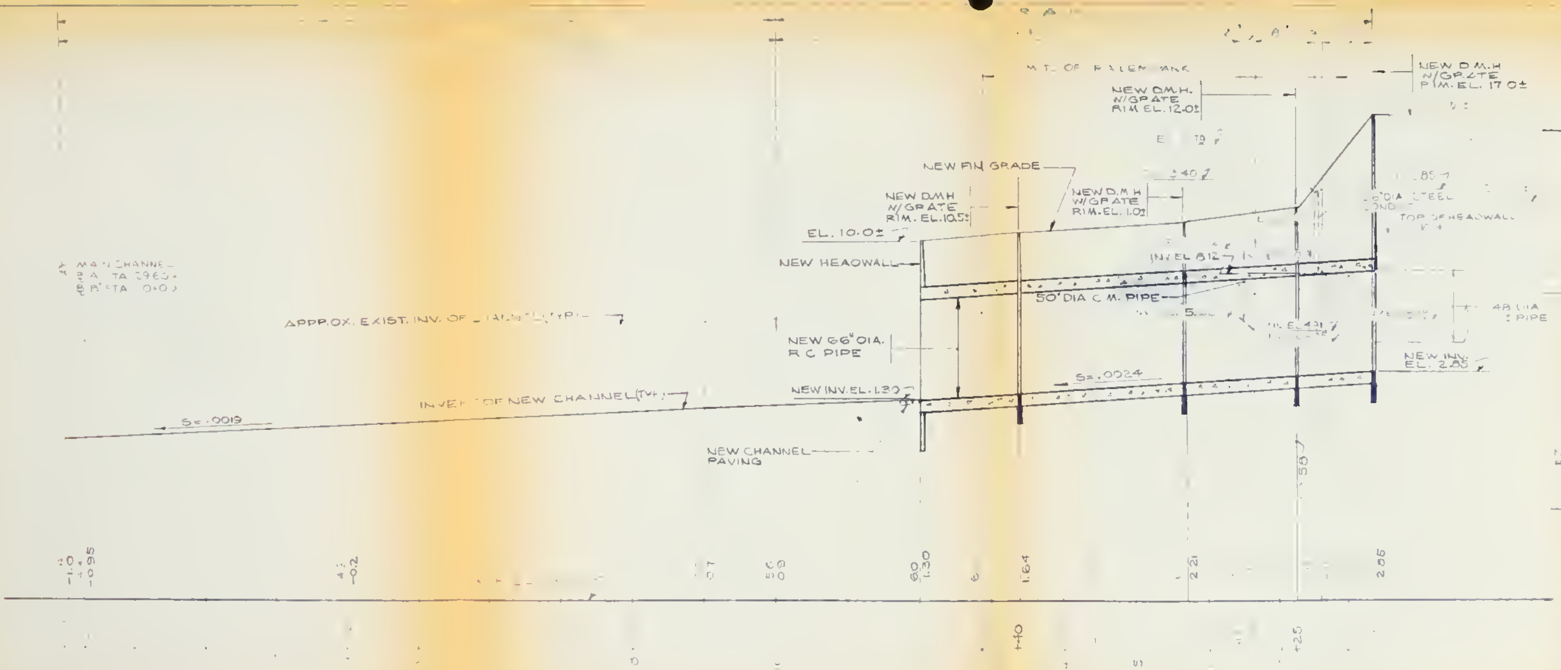
PROFILE "B"
SCALE: HOR. 1" = 100'
VERT. 1" = 4'

REVERE, SALES CREEK - FLOOD CONTROL STUDY

PROFILE - NEW SYSTEM

ANDREW CHRISTO ENGINEERS, BOSTON, MASS.

PLATE NO. 26



NOTES

1) A ... BOSTON ... E

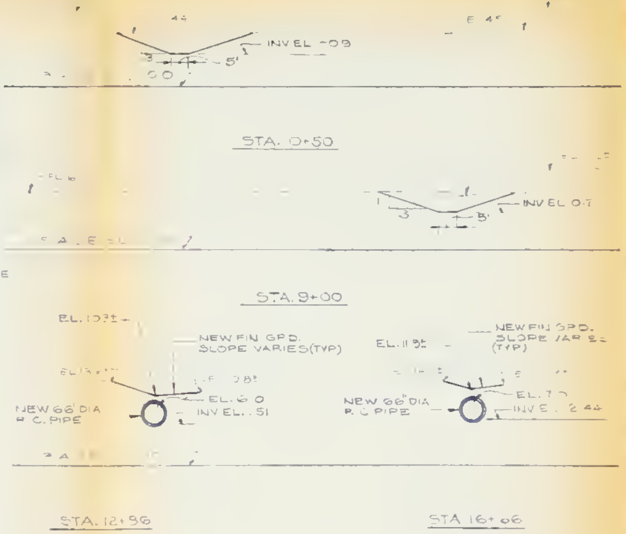
2) FOR ... INFORMATION SEE

... OF WATERWAYS NOTEBOOK ...

PROFILE ℄ 'B'

SCALE HORIZ

VERT 1:4



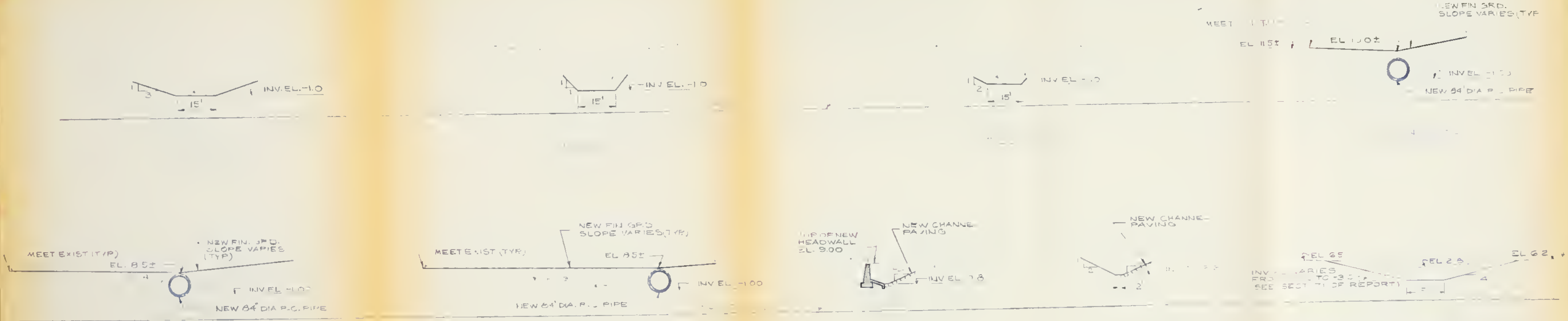
CROSS SECTIONS ℄ "B"

SCALE 1"=20'

REVERE, SALES CREEK - FLOOD CONTROL STUDY

PROFILE - NEW SYSTEM

ANDREW CHRISTO ENGINEERS, BOSTON, MASS



TYPICAL SECTION THROUGH BELLE INLET

APPENDIX B

BORING LOGS

3-2

NEW ENGLAND TEST BORING CORP.

Tel. 567-7526

TEST BORING REPORT

BOSTON, MASSACHUSETTS

To Andrew Christo, Engineers Date 9/21/73 Job No. 5135

Location Beachmont, Mass. Scale 1" = 8 ft.

gures in right hand column indicate number of blows required to drive 2 inch sampling spoon 1 foot, using 140-lb. weight falling 30 inches

Water levels may be affected by tides.

BORING # 1
Elev. 10.4

Depth	Description	Blows
	LOOSE ASHES SAND & MISC. FILL	3
-6"	SOFT GRAY ORGANIC PEATY SILT	2
10'	SOFT GRAY ORGANIC PEATY SILT	1
-6"	LOOSE FINE GRAY SILTY SAND	5
32'	MEDIUM DENSE FINE GRAY SAND TRACE OF SILT	11
36'	MEDIUM DENSE FINE TO MED. GRAY SAND TR. SEASHELLS	15
40'	Water level 8'0" below ground surface	

BORING # 2
Elev. 15.5

Depth	Description	Blows
	LOOSE SAND, GRAVEL, CINDERS & MISC. FILL	4
8'	LOOSE SAND ASHES & SILT FILL	2
10'	VERY SOFT GRAY ORGANIC SILT & BROWN PEAT	1
20'	MEDIUM DENSE FINE TO MEDIUM GRAY SAND & TRACE OF FINE GRAVEL	14
30'	Water level 8'6" below ground surface	

Note: All elevations refer to Boston City Base

Water levels indicated are those observed at the completion of each boring, and do not necessarily represent permanent ground water le

NEW ENGLAND TEST BORING CORP.

Tel. 567-7526

TEST BORING REPORT

BOSTON, MASSACHUSETTS

To Andrew Christo, Engineers Date 9/21/73 Job No. 5135

ocation Beachmont, Mass. Scale 1" = 8 ft.

gures in right hand column indicate number of blows required to drive 2 inch sampling spoon 1 foot, using 140-lb. weight falling 30 inches

BORING # 3
Elev. 11.1

	LOOSE SAND, ASHES SILT & MISC. FILL	6
6'		
	SOFT BROWN PEAT	3
-6"		
	MEDIUM DENSE COARSE TO MEDIUM GRAY SAND & GRAVEL	13
5'		
	Water level 4'6" below ground surface	

BORING # 4
Elev. 16.1

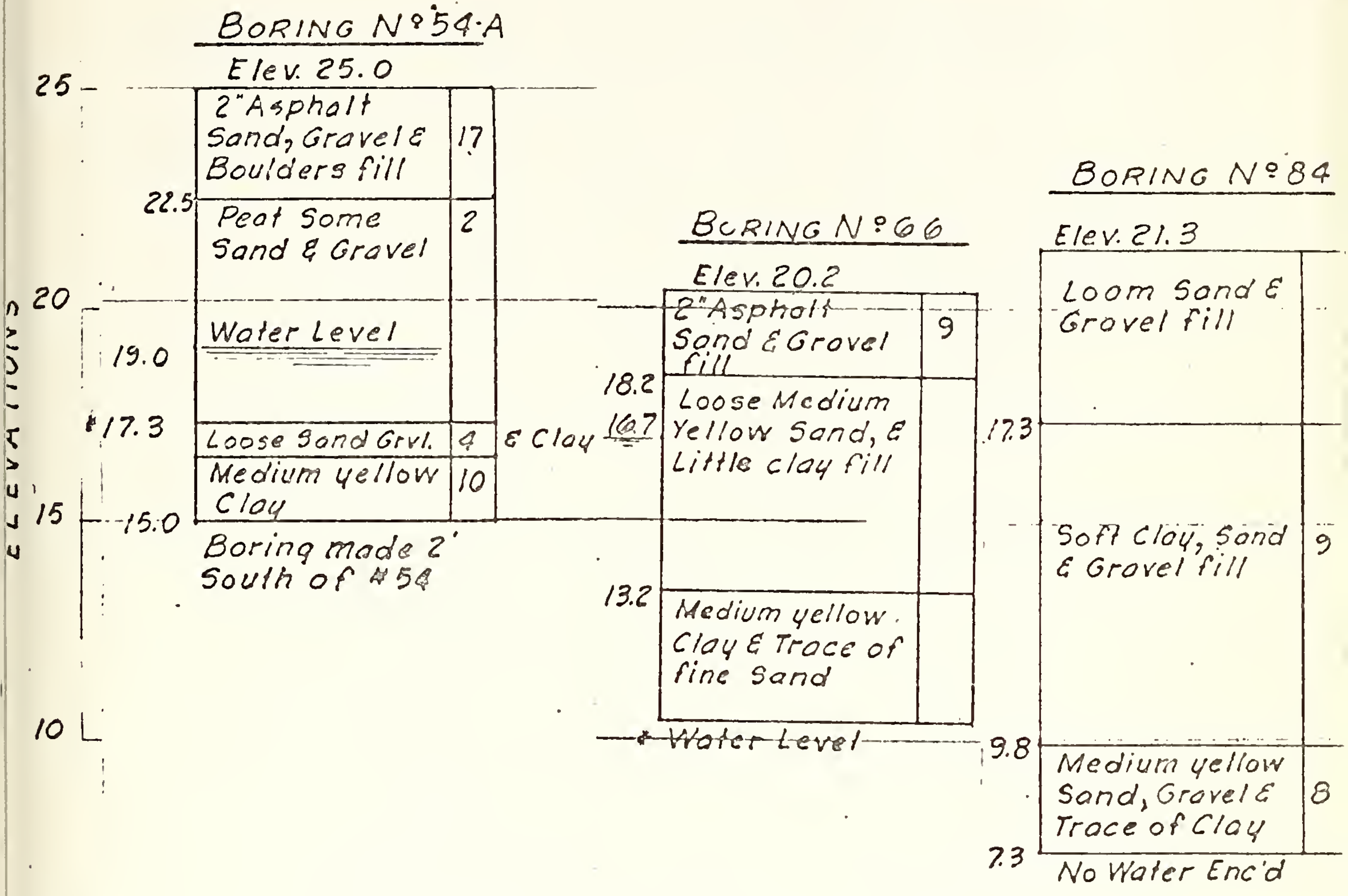
	DENSE SAND, GRAVEL BOULDERS & MISC. FILL	41
8'		
	LOOSE SAND, SILT, WOOD & MISC. FILL	7
13'		
	COARSE GRAY SAND & GRAVEL	17
16'		
	SOFT GRAY ORGANIC SILT	3
23'6"		
	SOFT GRAY ORGANIC SILT	2
29'6"		
	STIFF YELLOW SILTY CLAY	17
35'		
	Water level 9'6" below ground surface	

Note: All elevations refer to Boston City Base

ater levels indicated are those observed at the completion of each boring, and do not necessarily represent permanent ground water lev

U.S.G.S. BORING LOGS

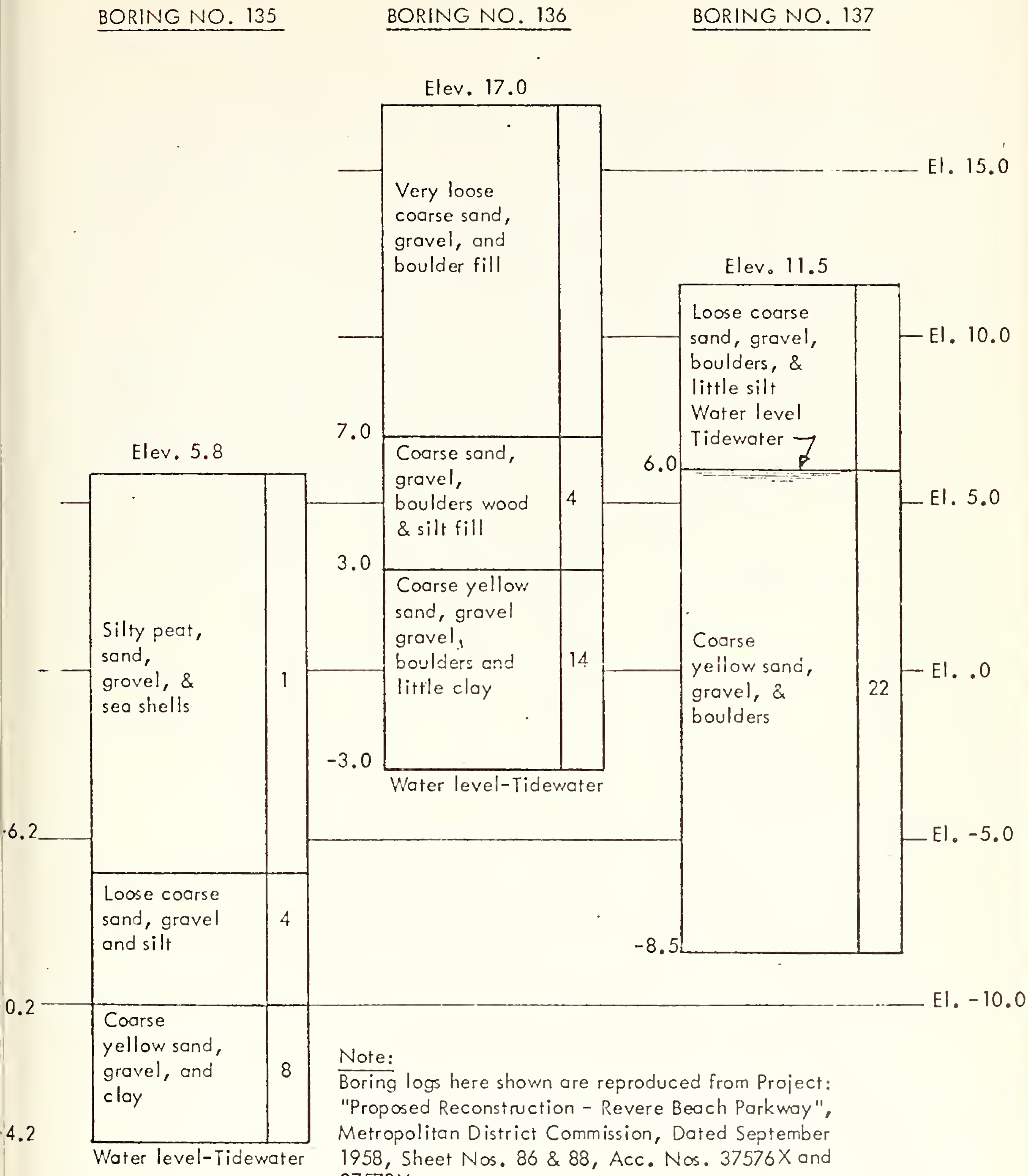
Boring No.	Depth of Well (ft)	Depth to Water Table (ft)		Boring Profile Depth (ft)
8	35	3	0	
				- sandy loam
			2.5	
				- hard coarse sand and coarse gravel
			9.7	
				- firm coarse sand and gravel
			35	
10	43	-	0	
				- fill
			4.2	
				- mud
			9.2	
				- compact muddy sand and gravel
			15.0	
				- compact sand and gravel
			21.2	
				- compact sand and gravel and clay
			31.0	
				- sand with gravel and little clay
			37.5	
				- clay and very fine sand, some gravel and shell fragments
			43.2	
				- rock
16	16	-	0	
				- sand and gravel fill
			2.75	
				- fine sand and gravel and boulders
			9.4	
				- fine sand
			11.35	
				- hard sand and gravel and boulders
			16.0	
17	60	-	0	
				- coarse sand
			12.1	
				- sand and clay
			23.6	
				- blue sand and clay
			36.1	
				- sandy clay
			54.1	
				- clay
			60.1	
18	74	-	0	
				- fill
			11.2	
				- soft silt
			24.8	
				- firm silty fine sand
			42.1	
				- sharp silty sand and shells
			53.5	
				- coarse and dirty sand and gravel
			61.9	
				- fine sand and clay
			65.0	
				- yellow clay
			74.0	
19	60	-	0	
				- clay and sand and gravel
			60.0	


ELEVATIONS
25
20
15
10
BORING Nº 54-A
Elev. 25.0
2" Asphalt
Sand, Gravel & Boulders fill
17
22.5
Peat Some Sand & Gravel
2
Water Level
19.0
17.3
Loose Sand Grvl.
4
& Clay
Medium yellow Clay
10
15.0
Boring made 2' South of #54
BORING Nº 66
Elev. 20.2
~~2" Asphalt~~
Sand & Gravel fill
9
18.2
Loose Medium Yellow Sand, & Little clay fill
16.7
13.2
Medium yellow Clay & Trace of fine Sand
~~Water Level~~
BORING Nº 84
Elev. 21.3
Loom Sand & Gravel fill
17.3
Soft Clay, Sand & Gravel fill
9
9.8
Medium yellow Sand, Gravel & Trace of Clay
8
7.3
No Water Enc'd

U.S.G.S. BORING LOGS

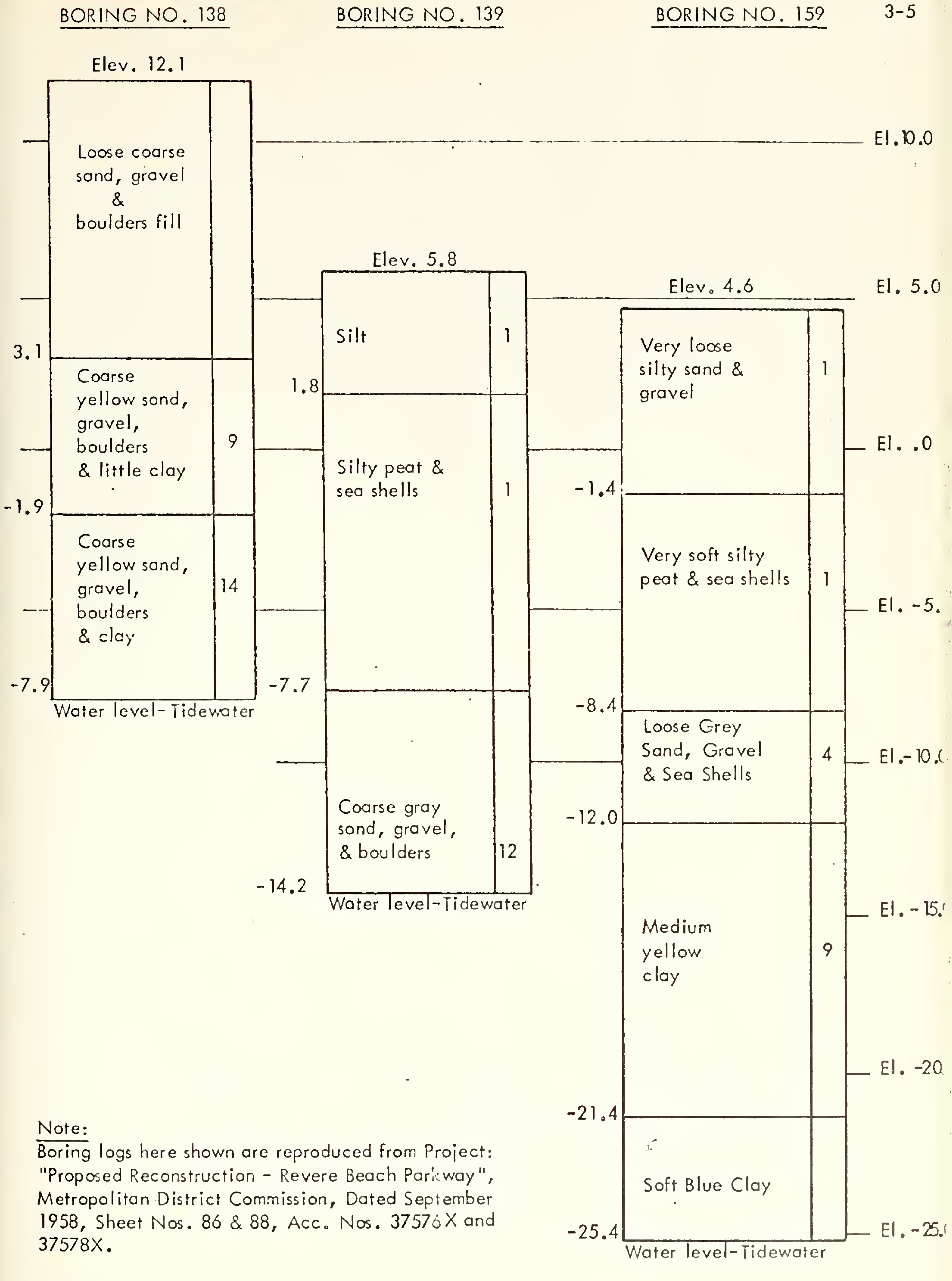
Boring No.	74	78	80	81	82
Soil Classifications and Soil Depths	A_5 *	E_4	A_7	A_9	A_5
	B_{16}	B_{23}	B_{11}	B_{12}	$E_{10.5}$
	G_{40}	H_{32}	G_{33}	Ghy_{28}	$G_{24.5}$
		G_{44}		J_{30}	E_{30}
				R	

Legend: A - fill
B - fresh water and estuarine peat, organic silt, sand, and minor gravel
E - sand and gravel
G - clay, some silt
H - interbedded clay and sand
J - clayed till (drumlin till)
R - refusal
hy - hard, yellow
* - depth in feet below surface


BORING NO. 135
BORING NO. 136
BORING NO. 137
Elev. 17.0
Very loose coarse sand, gravel, and boulder fill
7.0
Coarse sand, gravel, boulders wood & silt fill
4
3.0
Coarse yellow sand, gravel gravel, boulders and little clay
14
-3.0
Water level-Tidewater
Elev. 11.5
Loose coarse sand, gravel, boulders, & little silt
Water level Tidewater
6.0
Coarse yellow sand, gravel, & boulders
22
-8.5
Elev. 5.8
Silty peat, sand, gravel, & sea shells
1
6.2
Loose coarse sand, gravel and silt
4
0.2
Coarse yellow sand, gravel, and clay
8
4.2
Water level-Tidewater
El. 15.0
El. 10.0
El. 5.0
El. .0
El. -5.0
El. -10.0

Note:
Boring logs here shown are reproduced from Project: "Proposed Reconstruction - Revere Beach Parkway", Metropolitan District Commission, Dated September 1958, Sheet Nos. 86 & 88, Acc. Nos. 37576X and 37578X.

All elevations refer to Boston City Base.



Note:
Boring logs here shown are reproduced from Project: "Proposed Reconstruction - Revere Beach Parkway", Metropolitan District Commission, Dated September 1958, Sheet Nos. 86 & 88, Acc. Nos. 37576X and 37578X.

All elevations refer to Boston City Base.

APPENDIX C

WATER QUALITY ANALYSES AND FIELD DATA NOTES

Prepared by:

Rebecca Longley

Biological Survey Data

000120

Date: 8/19/76

Time: 9:20

Sample Station No. and Description: 1 - Sales Creek

Location: City, Town(s): Revere, MA

Specific Location of Biological Station (refer to highways or other recognizable landmarks:

On Route 1A (northbound) and Route 145 cutoff.

Climatic Conditions:

(a) Air Temp: 23 (°c)

(b) Wind (direction and est. speed): 2W (mph)

(c) Cloud Cover: 20 (%)

(d) Precipitation: None X Moderate ____ Light ____ Heavy ____

(e) Tide: NA

High ____ Incoming ____

Low ____ Outgoing ____

Slack ____

Description of Water Body: Fresh X Brackish ____ Marine ____

Visibility (secchi disc)(m): max. depth

Morphological Characteristics:

(a) Width: 1 (m)

(b) Average Depth: 0.4 (m)

(c) Maximum Depth: 0.6 (m)

(d) Area: NA (acres)

Salinity: 0.4 ppt.

(e) Velocity: NA (m/sec)

(f) Substrate:

Boulder ____ (%) Silt ____ (%)

Rubble 5 (%) Clay ____ (%)

Gravel ____ (%) Muck ____ (%)

Sand 95 (%) Other ____ (%)

Stratification of Water Column: yes ____ no X

If depth of water column exceeds 2 meters, conduct temperature and oxygen profile at half meter intervals and record data on Biological Survey Data Sheet 2.

(a) Surface Temperature (°c): 21

(b) Bottom Temperature (°c): -

(c) Surface Oxygen: 0.6 ppm.

(d) Bottom Oxygen: -

CO_2: 106 mg/L

PRELIMINARY FIELD OBSERVATIONS AND ANALYSIS:

(a) Plankton: (Include observations such as presence of a "bloom", windrowed algae, amorphous material, anticipated density, etc.

Sample Station: 1
(continued)

Periphyton: (Include observations such as type of substrate from which the sample was collected, anticipated density, composition)

A red filamentous growth was observed on substrate identified as *Crenothrix polyspora* an iron bacterium.

Macrophyton: (Include observations on the kinds of species observed, relative density of floating, emergent, and submerged species)

Macroinvertebrates: (Include notes on substrate suitability, major orders of invertebrates, qualitative assessment)

4 Surber grabs yielded *Physa* and *Limnodrilus*.

Fish: (Include observations on the health, kinds and numbers of species obtained)

marks and Additional Information such as pollution sources, sampling roblems, etc.:

A septic odor was observed when the bottom sediments were disturbed.

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM
Sales Creek Project
Revere, MA

SAMPLE MARKED
Sample Station 1

ANALYSIS NO. 00120
DATE OF COLLECTION
DATE OF ANALYSIS 8/19/76

Temperature — °C	21
Color-Apparent	
Turbidity — JTU	80
Alkalinity*	
–Phenolphthalein	0.0
–Total	213.0
Chloride*	
Hardness*	
–Total	
Metal*	
–Cadmium	<0.02
–Chromium	0.050
–Copper	0.36
–Iron-Total	6.8
–Lead	<0.05
–Manganese	
–Mercury	0.007
–Sodium	
–Zinc	<0.02
Nitrogen*	
–Ammonia as N.	2.00
–Nitrite as N.	<0.02
–Nitrate as N	1.4
–Total Kjeldahl as N.	

Phosphate*	
–Ortho as P	
–Total as P	0.11
Oil-Grease*	24.2
Phenol*	0.020
pH	7.1
Carbon Dioxide*	106
Oxygen, Dissolved*	0.6
Oxygen Demand, Biochemical (BOD)*	21.0
Oxygen Demand, Chemical (COD)*	
Solids*	
–Total	855.0
–Suspended	4.0
–Dissolved	851
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	1,900
Bacteria**	
–Total Coliform	>70,000
–Fecal Coliform	10,520
–Fecal Streptococci	
–Total Bacteria	
Salinity %	<0.5

REMARKS

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND – None Detected
< – Less Than
TNTC = To Numerous To Count

WATER QUALITY LABORATORY

BY David E Newton
David E. Newton

Prepared by:

Rebecca Longley

Biological Survey Data

000121

Date: 9/19/76

Time: 11:20

1. Sample Station No. and Description: 2 - Sales Creek

2. Location: City, Town(s): Revere, MA
Specific Location of Biological Station (refer to highways or other recognizable landmarks:

Approx. 90 meters upstream of Suffolk Downs horse stables.

3. Climatic Conditions:
(a) Air Temp: 21 (°c)
(b) Wind (direction and est. speed): 10-20 W (mph)
(c) Cloud Cover: 40 (%)
(d) Precipitation: None X Moderate ___ Light ___ Heavy ___
(e) Tide: NA
High ___ Incoming ___
Low ___ Outgoing ___
Slack ___

4. Description of Water Body: Fresh X Brackish ___ Marine ___

5. Visibility (secchi disc) (m): max. depth

6. Morphological Characteristics:
(a) Width: 8 (m)
(b) Average Depth: 0.2 (m)
(c) Maximum Depth: 0.3 (m)
(d) Area: NA (acres)
Salinity: <0.2 ppt.
(e) Velocity: NA (m/sec)
(f) Substrate:
Boulder ___ (%) Silt ___ (%)
Rubble ___ (%) Clay ___ (%)
Gravel ___ (%) Muck 100 (%)
Sand ___ (%) Other ___ (%)

7. Stratification of Water Column: yes ___ no X

If depth of water column exceeds 2 meters, conduct temperature and oxygen profile at half meter intervals and record data on Biological Survey Data Sheet 2.

(a) Surface Temperature (°c): 22
(b) Bottom Temperature (°c): -
(c) Surface Oxygen: 9.0 ppm
(d) Bottom Oxygen: -
CO_2: 88 mg/L

8. PRELIMINARY FIELD OBSERVATIONS AND ANALYSIS:
(a) Plankton: (Include observations such as presence of a "bloom", windrowed algae, amorphous material, anticipated density, etc.
Reddish tinge noticed on bottom, probably iron bacteria, *Crenothrix polyspora*.

Sample Station: 2
(continued)

) Periphyton: (Include observations such as type of substrate from which the sample was collected, anticipated density, composition)

) Macrophyton: (Include observations on the kinds of species observed, relative density of floating, emergent, and submerged species)

) Macroinvertebrates: (Include notes on substrate suitability, major orders of invertebrates, qualitative assessment)

4 Surber grabs yielded Odonata.

) Fish: (Include observations on the health, kinds and numbers of species obtained)

emarks and Additional Information such as pollution sources, sampling problems, etc.:

Difficult excess due to step embankments on either side covered by *Phragmites*.

When bottom sediments were stirred oil was released.

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM

Sales Creek Project
Revere, MA

SAMPLE MARKED

Sample Station 2

ANALYSIS NO. 00121
DATE OF COLLECTION 8/19/76
DATE OF ANALYSIS

Temperature – °C	22
Color-Apparent	
Turbidity – JTU	56
Alkalinity*	
–Phenolphthalein	0.0
–Total	137.5
Chloride*	
Hardness*	
–Total	
Metal*	
–Cadmium	<0.02
–Chromium	0.064
–Copper	0.38
–Iron-Total	5.4
–Lead	0.06
–Manganese	
–Mercury	0.005
–Sodium	
–Zinc	<0.02
Nitrogen*	
–Ammonia as N.	0.46
–Nitrite as N.	1.4
–Nitrate as N	1.7
–Total Kjeldahl as N.	

Phosphate*	
–Ortho as P	
–Total as P	0.14
Oil-Grease*	29.8
Phenol*	0.012
pH	7.3
Carbon Dioxide*	88
Oxygen, Dissolved*	9.0
Oxygen Demand, Biochemical (BOD)*	6.0
Oxygen Demand, Chemical (COD)*	
Solids*	
–Total	3,289.0
–Suspended	57.0
–Dissolved	3,232
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	3,100
Bacteria**	
–Total Coliform	5,000
–Fecal Coliform	280
–Fecal Streptococci	
–Total Bacteria	
Salinity %	<0.5

REMARKS

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND – None Detected
< – Less Than
TNTC = To Numerous To Count

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Prepared by:

Rebecca Longley

Biological Survey Data

000122

Date: 8/19/76

Time: 13:00

1. Sample Station No. and Description: 3- Sales Creek

2. Location: City, Town(s): Revere, MA
Specific Location of Biological Station (refer to highways or other recognizable landmarks:

Approx. 300 meters upstream of Suffolk Downs track.

3. Climatic Conditions:
(a) Air Temp: 21 (°c)
(b) Wind (direction and est. speed): 5 NE (mph)
(c) Cloud Cover: 20 (%)
(d) Precipitation: None X Moderate ___ Light ___ Heavy ___
(e) Tide: NA
High ___ Incoming ___
Low ___ Outgoing ___
Slack ___

4. Description of Water Body: Fresh X Brackish ___ Marine ___

5. Visibility (secchi disc)(m): max. depth

6. Morphological Characteristics:
(a) Width: 3 (m)
(b) Average Depth: 0.1 (m)
(c) Maximum Depth: 0.2 (m)
(d) Area: NA (acres)
Salinity: <0.2 ppt.
(e) Velocity: NA (m/sec)
(f) Substrate:

Boulder	(%)	Silt	(%)
Rubble	(%)	Clay	(%)
Gravel	(%)	Muck	30 (%)
Sand	70 (%)	Other	(%)

7. Stratification of Water Column: yes ___ no X

If depth of water column exceeds 2 meters, conduct temperature and oxygen profile at half meter intervals and record data on Biological Survey Data Sheet 2.

(a) Surface Temperature (°c): 22
(b) Bottom Temperature (°c): -
(c) Surface Oxygen: 5.3 ppm
(d) Bottom Oxygen: -
CO_2: 106 mg/L

8. PRELIMINARY FIELD OBSERVATIONS AND ANALYSIS:
(a) Plankton: (Include observations such as presence of a "bloom", windrowed algae, amorphous material, anticipated density, etc.
Reddish tinge on the bottom due to the *Crenothrix polyspora*.

Sample Station: 3
(continued)

) Periphyton: (Include observations such as type of substrate from which the sample was collected, anticipated density, composition)

) Macrophyton: (Include observations on the kinds of species observed, relative density of floating, emergent, and submerged species)

) Macroinvertebrates: (Include notes on substrate suitability, major orders of invertebrates, qualitative assessment)

4 Surber grabs were taken.

) Fish: (Include observations on the health, kinds and numbers of species obtained)

emarks and Additional Information such as pollution sources, sampling problems, etc.:

Phragmites lined the steep banks on either side of the creek.

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM

Sales Creek Project
Revere, MA

SAMPLE MARKED

Sample Station 3

ANALYSIS NO. 00122
DATE OF COLLECTION
DATE OF ANALYSIS 8/19/76

Temperature – °C	22
Color-Apparent	
Turbidity – JTU	84
Alkalinity*	
–Phenolphthalein	0.0
–Total	200.0
Chloride*	
Hardness*	
–Total	
Metal*	
–Cadmium	<0.02
–Chromium	0.064
–Copper	0.24
–Iron-Total	7.6
–Lead	<0.05
–Manganese	
–Mercury	0.007
–Sodium	
–Zinc	<0.02
Nitrogen*	
–Ammonia as N.	0.60
–Nitrite as N.	0.19
–Nitrate as N	1.1
–Total Kjeldahl as N.	

Phosphate*	
–Ortho as P	
–Total as P	0.15
Oil-Grease*	58.4
Phenol*	0.005
pH	7.1
Carbon Dioxide*	106
Oxygen, Dissolved*	5.3
Oxygen Demand, Biochemical (BOD)*	11.5
Oxygen Demand, Chemical (COD)*	
Solids*	
–Total	3,275.0
–Suspended	35.0
–Dissolved	3,240
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	3,400
Bacteria**	
–Total Coliform	2,000
–Fecal Coliform	210
–Fecal Streptococci	
–Total Bacteria	
Salinity %	<0.5

REMARKS

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND – None Detected
< – Less Than
TNTC = To Numerous To Count

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Prepared by:
Rebecca Longley

Biological Survey Data

000123

Date: 8/19/76

Time: 14:15

1. Sample Station No. and Description: 4 - Sales Creek

2. Location: City, Town(s): Revere, MA
Specific Location of Biological Station (refer to highways or other recognizable landmarks:

Approx. 30 meters north of Winthrop St.

3. Climatic Conditions:
(a) Air Temp: 29 (°c)
(b) Wind (direction and est. speed): 5 NE (mph)
(c) Cloud Cover: 10 (%)
(d) Precipitation: None X Moderate ____ Light ____ Heavy ____
(e) Tide: NA
High ____ Incoming ____
Low ____ Outgoing ____
Slack ____

4. Description of Water Body: Fresh X Brackish ____ Marine ____

5. Visibility (secchi disc)(m): max. depth

6. Morphological Characteristics:
(a) Width: 2 (m)
(b) Average Depth: 0.1 (m)
(c) Maximum Depth: 0.2 (m)
(d) Area: NA (acres)
Salinity: <0.2 ppt
(e) Velocity: NA (m/sec)
(f) Substrate:

Boulder	(%)	Silt	(%)
Rubble	(%)	Clay	(%)
Gravel	(%)	Muck	20 (%)
Sand	80 (%)	Other	(%)

7. Stratification of Water Column: yes ____ no X

If depth of water column exceeds 2 meters, conduct temperature and oxygen profile at half meter intervals and record data on Biological Survey Data Sheet 2.

(a) Surface Temperature (°c): 19
(b) Bottom Temperature (°c): -
(c) Surface Oxygen: 1.5 ppm
(d) Bottom Oxygen: -
CO_2: 97 mg/L

8. PRELIMINARY FIELD OBSERVATIONS AND ANALYSIS:
(a) Plankton: (Include observations such as presence of a "bloom", windrowed algae, amorphous material, anticipated density, etc.

Sample Station: 4
(continued)

Periphyton: (Include observations such as type of substrate from which the sample was collected, anticipated density, composition)

Macrophyton: (Include observations on the kinds of species observed, relative density of floating, emergent, and submerged species)
A small patch of duckweed, *Elodea*, was observed.

) Macroinvertebrates: (Include notes on substrate suitability, major orders of invertebrates, qualitative assessment)
4 Surber grabs were taken.

) Fish: (Include observations on the health, kinds and numbers of species obtained)

emarks and Additional Information such as pollution sources, sampling problems, etc.:

Water Quality Laboratory

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REPORT OF LABORATORY ANALYSIS

FROM
Sales Creek Project
Revere, MA

SAMPLE MARKED
Sample Station 4

ANALYSIS NO. 00123
DATE OF COLLECTION
DATE OF ANALYSIS 8/19/76

Temperature — °C	19
Color-Apparent	
Turbidity — JTU	68
Alkalinity*	
—Phenolphthalein	0.0
—Total	140.0
Chloride*	
Hardness*	
—Total	
Metal*	
—Cadmium	<0.02
—Chromium	0.046
—Copper	0.36
—Iron-Total	5.0
—Lead	<0.05
—Manganese	
—Mercury	0.001
—Sodium	
—Zinc	<0.02
Nitrogen*	
—Ammonia as N.	0.72
—Nitrite as N.	1.4
—Nitrate as N	2.0
—Total Kjeldahl as N.	

Phosphate*	
—Ortho as P	
—Total as P	0.37
Oil-Grease*	36.6
Phenol*	0.004
pH	6.7
Carbon Dioxide*	97
Oxygen, Dissolved*	1.5
Oxygen Demand, Biochemical (BOD)*	21.5
Oxygen Demand, Chemical (COD)*	
Solids*	
—Total	995.0
—Suspended	80.0
—Dissolved	915
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	1,400
Bacteria**	
—Total Coliform	>70,000
—Fecal Coliform	6,660
—Fecal Streptococci	
—Total Bacteria	
Salinity %	<0.5

REMARKS

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND – None Detected
< – Less Than
TNTC = To Numerous To Count

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Prepared by: Rebecca Longley

Biological Survey Data

000124

Date: 8/25/76

Time: 15:15

1. Sample Station No. and Description: 5 - Sales Creek Project

2. Location: City, Town(s): Revere, MA
Specific Location of Biological Station (refer to highways or other recognizable landmarks:

Approx. 300 meters south of red brick apartment building on Belle Isle Inlet.

3. Climatic Conditions:
(a) Air Temp: 21 (°c)
(b) Wind (direction and est. speed): 10 NE (mph)
(c) Cloud Cover: 20 (%)
(d) Precipitation: None X Moderate ___ Light ___ Heavy ___
(e) Tide:
High ___ Incoming X
Low ___ Outgoing ___
Slack ___

4. Description of Water Body: Fresh ___ Brackish ___ Marine X

5. Visibility (secchi disc) (m): 0.5

6. Morphological Characteristics:
(a) Width: 11 (m)
(b) Average Depth: 1.0 (m)
(c) Maximum Depth: 1.5 (m)
(d) Area: NA (acres)
Salinity: 29.5 ppt.
(e) Velocity: NA (m/sec)
(f) Substrate: NA
Boulder ___ (%) Silt ___ (%)
Rubble ___ (%) Clay ___ (%)
Gravel ___ (%) Muck ___ (%)
Sand ___ (%) Other ___ (%)

7. Stratification of Water Column: yes ___ no X

If depth of water column exceeds 2 meters, conduct temperature and oxygen profile at half meter intervals and record data on Biological Survey Data Sheet 2.

(a) Surface Temperature (°c): 23
(b) Bottom Temperature (°c): -
(c) Surface Oxygen: 9.3 ppm
(d) Bottom Oxygen: -
CO_2: 62 mg/L

8. PRELIMINARY FIELD OBSERVATIONS AND ANALYSIS:
(a) Plankton: (Include observations such as presence of a "bloom", windrowed algae, amorphous material, anticipated density, etc.
Floating green algae was identified as *Enteromorpha*.

Sample Station: 5
(continued)

Periphyton: (Include observations such as type of substrate from which the sample was collected, anticipated density, composition)

) Macrophyton: (Include observations on the kinds of species observed, relative density of floating, emergent, and submerged species)

) Macroinvertebrates: (Include notes on substrate suitability, major orders of invertebrates, qualitative assessment)

) Fish: (Include observations on the health, kinds and numbers of species obtained)

emarks and Additional Information such as pollution sources, sampling problems, etc.:

Water Quality Laboratory

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REPORT OF LABORATORY ANALYSIS

FROM

Sales Creek Project
Revere, MA

SAMPLE MARKED

Sample Station 5

ANALYSIS NO. 00124
DATE OF COLLECTION 8/19/76
DATE OF ANALYSIS

Temperature — °C	23	Phosphate*	
Color-Apparent		—Ortho as P	
Turbidity — JTU	36	—Total as P	0.53
Alkalinity*		Oil-Grease*	74.6
—Phenolphthalein	0.0	Phenol*	0.003
—Total	117.5	pH	8.2
Chloride*		Carbon Dioxide*	62
Hardness*		Oxygen, Dissolved*	9.3
—Total		Oxygen Demand, Biochemical (BOD)*	<1.0
Metal*		Oxygen Demand, Chemical (COD)*	
—Cadmium	<0.02	Solids*	
—Chromium	0.003	—Total	28,644.0
—Copper	0.11	—Suspended	74.0
—Iron-Total	1.2	—Dissolved	28,570
—Lead	<0.05	Sulfate*	
—Manganese		Sodium Chloride*	
—Mercury	0.019	Conductivity (MICRO MHOS/CM)	42,000
—Sodium		Bacteria**	
—Zinc	<0.02	—Total Coliform	ND
Nitrogen*		—Fecal Coliform	ND
—Ammonia as N.	0.19	—Fecal Streptococci	
—Nitrite as N.	<0.02	—Total Bacteria	
—Nitrate as N	3.5	Salinity %	29.5
—Total Kjeldahl as N.			

REMARKS

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND — None Detected
< — Less Than
TNTC = To Numerous To Count

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Prepared by:
Rebecca Longley

Biological Survey Data

000125

Date: 8/25/76

Time: 15:30

1. Sample Station No. and Description: 6 - Sales Creek Project

2. Location: City, Town(s): Revere, MA
Specific Location of Biological Station (refer to highways or other recognizable landmarks:

Approx. .8 km. south of satellite tracking station on Belle Isle Inlet.

3. Climatic Conditions:
(a) Air Temp: 22 (°c)
(b) Wind (direction and est. speed): 15NE (mph)
(c) Cloud Cover: 20 (%)
(d) Precipitation: None X Moderate ____ Light ____ Heavy ____
(e) Tide:
High ____
Low ____
Slack ____
Incoming X
Outgoing ____

4. Description of Water Body: Fresh ____ Brackish ____ Marine X

5. Visibility (secchi disc) (m): 0.8

6. Morphological Characteristics:
(a) Width: 15 (m)
(b) Average Depth: 1.0 (m)
(c) Maximum Depth: 1.5 (m)
(d) Area: ____ (acres)
Salinity: 30.2 ppt.
(e) Velocity: NA (m/sec)
(f) Substrate: NA
Boulder ____ (%)
Rubble ____ (%)
Gravel ____ (%)
Sand ____ (%)
Silt ____ (%)
Clay ____ (%)
Muck ____ (%)
Other ____ (%)

7. Stratification of Water Column: yes ____ no X

If depth of water column exceeds 2 meters, conduct temperature and oxygen profile at half meter intervals and record data on Biological Survey Data Sheet 2.

(a) Surface Temperature (°c): 22
(b) Bottom Temperature (°c): -
(c) Surface Oxygen: 7.5 ppm
(d) Bottom Oxygen: -
CO_2: 62 mg/L

8. PRELIMINARY FIELD OBSERVATIONS AND ANALYSIS:
(a) Plankton: (Include observations such as presence of a "bloom", windrowed algae, amorphous material, anticipated density, etc.
Floating green algae was identified as *Enteromorpha*.

Sample Station: 6
(continued)

Periphyton: (Include observations such as type of substrate from which the sample was collected, anticipated density, composition)

) Macrophyton: (Include observations on the kinds of species observed, relative density of floating, emergent, and submerged species)

) Macroinvertebrates: (Include notes on substrate suitability, major orders of invertebrates, qualitative assessment)

) Fish: (Include observations on the health, kinds and numbers of species obtained)

emarks and Additional Information such as pollution sources, sampling problems, etc.:

Water Quality Laboratory

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REPORT OF LABORATORY ANALYSIS

FROM Sales Creek Project
Revere, MA

SAMPLE MARKED Sample Station 6

ANALYSIS NO. 00125
DATE OF COLLECTION
DATE OF ANALYSIS 8/19/76

Temperature – °C	22
Color-Apparent	
Turbidity – JTU	20
Alkalinity*	
–Phenolphthalein	0.0
–Total	108.5
Chloride*	
Hardness*	
–Total	
Metal*	
–Cadmium	<0.02
–Chromium	0.003
–Copper	0.20
–Iron-Total	1.0
–Lead	<0.05
–Manganese	
–Mercury	0.019
–Sodium	
–Zinc	<0.02
Nitrogen*	
–Ammonia as N.	0.26
–Nitrite as N.	<0.02
–Nitrate as N	3.5
–Total Kjeldahl as N.	

Phosphate*	
–Ortho as P	
–Total as P	0.26
Oil-Grease*	41.6
Phenol*	0.003
pH	8.1
Carbon Dioxide*	62
Oxygen, Dissolved*	7.5
Oxygen Demand, Biochemical (BOD)*	<1.0
Oxygen Demand, Chemical (COD)*	
Solids*	
–Total	34,330.0
–Suspended	30.0
–Dissolved	34,300
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	38,000
Bacteria**	
–Total Coliform	ND
–Fecal Coliform	ND
–Fecal Streptococci	
–Total Bacteria	
Salinity %	30.2

REMARKS

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND – None Detected
< – Less Than
TNTC = To Numerous To Count

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Prepared by:

Carlton Noyes

Biological Survey Data

000176

Date: 8/25/76

Time: 1330

1. Sample Station No. and Description: 7, Sales Creek Project

2. Location: City, Town(s): Revere, MA
Specific Location of Biological Station (refer to highways or other recognizable landmarks:

At tide gate (inland side) on Bennington ST.

3. Climatic Conditions:
(a) Air Temp: ______ (°c)
(b) Wind (direction and est. speed): ______ (mph)
(c) Cloud Cover: ______ (%)
(d) Precipitation: None X Moderate ____ Light ____ Heavy ____
(e) Tide:
High ____ Incoming ____
Low ____ Outgoing ____
Slack ____

4. Description of Water Body: Fresh ____ Brackish ____ Marine ____

5. Visibility (secchi disc) (m): ______

6. Morphological Characteristics:
(a) Width: ______ (m)
(b) Average Depth: ______ (m)
(c) Maximum Depth: ______ (m)
(d) Area: ______ (acres)
Salinity 1.0 ppt
(e) Velocity: ______ (m/sec)
(f) Substrate:
Boulder ____ (%) Silt ____ (%)
Rubble ____ (%) Clay ____ (%)
Gravel ____ (%) Muck ____ (%)
Sand ____ (%) Other ____ (%)

7. Stratification of Water Column: yes ____ no ____

If depth of water column exceeds 2 meters, conduct temperature and oxygen profile at half meter intervals and record data on Biological Survey Data Sheet 2.

(a) Surface Temperature (°c): 25
(b) Bottom Temperature (°c): -
(c) Surface Oxygen: 4.5
(d) Bottom Oxygen: -

8. PRELIMINARY FIELD OBSERVATIONS AND ANALYSIS:
(a) Plankton: (Include observations such as presence of a "bloom", windrowed algae, amorphous material, anticipated density, etc.

CO^2 140.0

Water was orange from iron

Sample Station: ________
(continued)

) Periphyton: (Include observations such as type of substrate from which the sample was collected, anticipated density, composition)

____

____

) Macrophyton: (Include observations on the kinds of species observed, relative density of floating, emergent, and submerged species)

____

____

) Macroinvertebrates: (Include notes on substrate suitability, major orders of invertebrates, qualitative assessment)

____

____

) Fish: (Include observations on the health, kinds and numbers of species obtained)

____

____

emarks and Additional Information such as pollution sources, sampling problems, etc.:

____

____

____

____

____

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM Sales Creek Project
Revere, MA

SAMPLE MARKED
Sample Station 7

ANALYSIS NO. 00176
DATE OF COLLECTION 8/25/76
DATE OF ANALYSIS

Temperature — °C	25
Color-Apparent	
Turbidity — JTU	73
Alkalinity*	
—Phenolphthalein	0.0
—Total	65.0
Chloride*	
Hardness*	
—Total	
Metal*	
—Cadmium	0.16
—Chromium	0.020
—Copper	0.35
—Iron-Total	1.5
—Lead	0.12
—Manganese	
—Mercury	0.018
—Sodium	
—Zinc	0.30
Nitrogen*	
—Ammonia as N.	0.60
—Nitrite as N.	0.05
—Nitrate as N	2.3
—Total Kjeldahl as N.	

Phosphate*	
—Ortho as P	
—Total as P	0.23
Oil-Grease*	16.2
Phenol*	0.003
pH	6.7
Carbon Dioxide*	140
Oxygen, Dissolved*	4.5
Oxygen Demand, Biochemical (BOD)*	5.5
Oxygen Demand, Chemical (COD)*	
Solids*	
—Total	784.0
—Suspended	29.0
—Dissolved	755
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	1,300
Bacteria**	
—Total Coliform	2,000
—Fecal Coliform	2,000
—Fecal Streptococci	
—Total Bacteria	
Salinity %	<0.5

REMARKS

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND — None Detected
< — Less Than

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM Sales Creek Project
Revere, MA

SAMPLE MARKED

Sample Station 7

ANALYSIS NO. 00177
DATE OF COLLECTION 8/28/76
DATE OF ANALYSIS

Temperature — °C	
Color-Apparent	
Turbidity — JTU	
Alkalinity*	
—Phenolphthalein	
—Total	
Chloride*	
Hardness*	
—Total	
Metal*	
—Cadmium	
—Chromium	
—Copper	
—Iron-Total	
—Lead	
—Manganese	
—Mercury	
—Sodium	
—Zinc	
Nitrogen*	
—Ammonia as N.	
—Nitrite as N.	
—Nitrate as N	
—Total Kjeldahl as N.	
Phosphate*	
—Ortho as P	
—Total as P	
Oil-Grease*	
Phenol*	
pH	
Carbon Dioxide*	
Oxygen, Dissolved*	
Oxygen Demand, Biochemical (BOD)*	
Oxygen Demand, Chemical (COD)*	
Solids*	
—Total	
—Suspended	
—Dissolved	
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	
Bacteria**	
—Total Coliform	400,000
—Fecal Coliform	383,000
—Fecal Streptococci	
—Total Bacteria	

REMARKS

Sample taken after extensive rain to check bacteria levels.

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND – None Detected
< – Less Than

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM Sales Creek Project

SAMPLE MARKED Sample Station 5

ANALYSIS NO. 00178
DATE OF COLLECTION
DATE OF ANALYSIS 9/14/76

Temperature – °C	
Color-Apparent	
Turbidity – JTU	
Alkalinity*	
–Phenolphthalein	
–Total	
Chloride*	
Hardness*	
–Total	
Metal*	
–Cadmium	
–Chromium	
–Copper	
–Iron-Total	
–Lead	
–Manganese	
–Mercury	
–Sodium	
–Zinc	
Nitrogen*	
–Ammonia as N.	
–Nitrite as N.	
–Nitrate as N	
–Total Kjeldahl as N.	

Phosphate*	
–Ortho as P	
–Total as P	
Oil-Grease*	
Phenol*	
pH	
Carbon Dioxide*	
Oxygen, Dissolved*	
Oxygen Demand, Biochemical (BOD)*	
Oxygen Demand, Chemical (COD)*	
Solids*	
–Total	
–Suspended	
–Dissolved	
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	
Bacteria**	
–Total Coliform	10
–Fecal Coliform	2
–Fecal Streptococci	
–Total Bacteria	

REMARKS

This sample was used to check results from Analysis Numbers 00124 and 00125.

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND – None Detected
< – Less Than

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM Sales Creek Project
Revere, MA

SAMPLE MARKED

Sample Station 2

ANALYSIS NO. 00203
DATE OF COLLECTION 10/20/76
DATE OF ANALYSIS

Temperature — °C	
Color-Apparent	
Turbidity — JTU	
Alkalinity*	
—Phenolphthalein	
—Total	
Chloride*	
Hardness*	
—Total	
Metal*	
—Cadmium	
—Chromium	
—Copper	
—Iron-Total	
—Lead	
—Manganese	
—Mercury	
—Sodium	
—Zinc	
Nitrogen*	
—Ammonia as N.	
—Nitrite as N.	
—Nitrate as N	
—Total Kjeldahl as N.	
Phosphate*	
—Ortho as P	
—Total as P	
Oil-Grease*	
Phenol*	
pH	
Carbon Dioxide*	
Oxygen, Dissolved*	
Oxygen Demand, Biochemical (BOD)*	
Oxygen Demand, Chemical (COD)*	
Solids*	
—Total	
—Suspended	
—Dissolved	
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	
Bacteria**	
—Total Coliform	45,000
—Fecal Coliform	670
—Fecal Streptococci	1,050
—Total Bacteria	

REMARKS

FC/FS ratio 0.64

Sample collected after Suffolk Downs was operating.

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND — None Detected
< — Less Than

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM Sales Creek Project
Revere, MA

SAMPLE MARKED

Sample Station 7

ANALYSIS NO. 00204
DATE OF COLLECTION
DATE OF ANALYSIS 10/20/76

Temperature – °C
Color-Apparent
Turbidity – JTU
Alkalinity*
–Phenolphthalein
–Total
Chloride*
Hardness*
–Total
Metal*
–Cadmium
–Chromium
–Copper
–Iron-Total
–Lead
–Manganese
–Mercury
–Sodium
–Zinc
Nitrogen*
–Ammonia as N.
–Nitrite as N.
–Nitrate as N
–Total Kjeldahl as N.

Phosphate*
–Ortho as P
–Total as P
Oil-Grease*
Phenol*
pH
Carbon Dioxide*
Oxygen, Dissolved*
Oxygen Demand, Biochemical (BOD)*
Oxygen Demand, Chemical (COD)*
Solids*
–Total
–Suspended
–Dissolved
Sulfate*
Sodium Chloride*
Conductivity (MICRO MHOS/CM)
Bacteria**
–Total Coliform 1,400
–Fecal Coliform 110
–Fecal Streptococci 450
–Total Bacteria

REMARKS FC/FS ratio 0.24

Sample collected after Suffolk Downs was operating.

*Milligram Per Liter (mg/1)
**Count Per 100 ml of Sample (MF)
ND – None Detected
< – Less Than

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM Sales Creek Project
Revere, MA

SAMPLE MARKED

Sample Station 2 - Sediment

ANALYSIS NO. 00121
DATE OF COLLECTION 8/25/76
DATE OF ANALYSIS

Temperature – °C	
Color-Apparent	
Turbidity – JTU	
Alkalinity*	
–Phenolphthalein	
–Total	
Chloride*	
Hardness*	
–Total	
Metal*	
–Cadmium	<0.01
–Chromium	18
–Copper	94
–Iron-Total	318,777
–Lead	1,113
–Manganese	
–Mercury	0.22
–Sodium	
–Zinc	633
Nitrogen*	
–Ammonia as N.	
–Nitrite as N.	
–Nitrate as N	
–Total Kjeldahl as N.	

Phosphate*	
–Ortho as P	
–Total as P	
Oil-Grease*	14,410
Phenol*	
pH	
Carbon Dioxide*	
Oxygen, Dissolved*	
Oxygen Demand, Biochemical (BOD)*	
Oxygen Demand, Chemical (COD)*	
Solids*	
–Total	
–Suspended	
–Dissolved	
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	
Bacteria**	
–Total Coliform	
–Fecal Coliform	
–Fecal Streptococci	
–Total Bacteria	

REMARKS

45.8 percent solids

*Milligrams Per-Kilogram Dry Weight
**Count Per 100 ml of Sample (MF)
ND – None Detected
< – Less Than

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

Water Quality Laboratory

194 WORCESTER STREET - ROUTE 9 - WELLESLEY HILLS, MASS. 02181 (617) 235-0777

REPORT OF LABORATORY ANALYSIS

FROM Sales Creek Project
Revere, MA

SAMPLE MARKED

Sample Station 6 - Sediment

ANALYSIS NO. 00125
DATE OF COLLECTION
DATE OF ANALYSIS 8/25/76

Temperature — °C	
Color-Apparent	
Turbidity — JTU	
Alkalinity*	
–Phenolphthalein	
–Total	
Chloride*	
Hardness*	
–Total	
Metal*	
–Cadmium	<0.01
–Chromium	19
–Copper	32
–Iron-Total	101.343
–Lead	56
–Manganese	
–Mercury	0.10
–Sodium	
–Zinc	71
Nitrogen*	
–Ammonia as N.	
–Nitrite as N.	
–Nitrate as N	
–Total Kjeldahl as N.	

Phosphate*	
–Ortho as P	
–Total as P	
Oil-Grease*	952
Phenol*	
pH	
Carbon Dioxide*	
Oxygen, Dissolved*	
Oxygen Demand, Biochemical (BOD)*	
Oxygen Demand, Chemical (COD)*	
Solids*	
–Total	
–Suspended	
–Dissolved	
Sulfate*	
Sodium Chloride*	
Conductivity (MICRO MHOS/CM)	
Bacteria**	
–Total Coliform	
–Fecal Coliform	
–Fecal Streptococci	
–Total Bacteria	

REMARKS

81.9 percent solids

*Milligrams Per-Kilogram Dry Weight
**Count Per 100 ml of Sample (MF)
ND — None Detected
< — Less Than

WATER QUALITY LABORATORY

BY David E. Newton
David E. Newton

APPENDIX D

BIBLIOGRAPHY

APPENDIX - D

BIBLIOGRAPHY

(1) Lord, Sabin, Massachusetts Division of Water Pollution Control. Personal Communication, 1976.

(2) Robach, Selwyn S., Insects (Arthropoda: Insecta). In: Hart, C.W., and S.L.H. Fuller (Eds) Pollution Ecology of Freshwater Invertebrates. Academic Press, New York, 1976.

(3) Martin, Alexander; Zim, Herbert S; Nelson, Arnold L.; American Wildlife and Plants, Dover Publications, N.Y., 1951.

(4) Luedtke, Barbara E., "Final Report on the Archaeological and Paleobotanical Resources of Twelve Islands in Boston Harbor," report submitted to Massachusetts Department of Natural Resources, 1975.

(5) Chen, F.Y., S.K. Gupta, A.Z. Sycip, J.C.S. Ju, M. Knezevic, and W.W. Choi. Research Study on the Effect of Dispersion, Settling, and Resedimentation on Migration of Chemical Constituents During Open-Water Disposal of Dredged Materials. Contract Report D-76-1, U.S. Army Engineer Waterways Experiment Station. Environmental Effects Laboratory, P.O. Box 631. Vicksburg, MS, 1976.

(6) Lee, G. Fred, et.al. Research Study for the Development of Dredged Material Disposal Criteria, University of Texas at Dallas, prepared for the U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS, 1975.

(7) Fulk, R., Gruber, D. and J. Wullschleger. Laboratory Study of the Release of Pesticide Materials to the Water Column During Dredging and Disposal Operations. U.S. Army Engineer Waterways Experiment Station. Vicksburg, MS, 1975.

APPENDIX E

COMMON AND SCIENTIFIC NAMES OF PLANT SPECIES

The Common and Scientific Names of Plant Species of the Sales Creek Study Area

Common Name	Scientific Name
Weeping Willow	Salix babylonica
Quaking Aspen	Populus tremuloides
Black Cherry	Prunus serotina
Smooth Sumac	Rhus glabra
Bayberry	Myrica pensylvanica
Common Elderberry	Sambucus canadensis
Japanese Knotweed	Polygonum cuspidatum
Pinkweed	Polygonum pensylvanicum
Tearthumb	Polygonum spp.
Water-Smartweed	Polygonum amphibium
Wild Carrot	Daucus carota
Burdock	Arctium minus
Common Milkweed	Asclepias syriaca
Rose	Rosa spp.
Bur-Marigold	Bidens spp.
Aster	Aster spp.
Common Ragweed	Ambrosia artemisiifolia
Sunflower	Helianthus spp.
Spiraea	Spiraea tomentosa
Sea-Lavender	Limonium carolinianum
Orach	Atriplex spp.
Trefoil	Lotus corniculatus
Common St. John's-Wort	Hypericum perforatum
Groundnut	Apios americana
Water-Plantain	Alisma spp.
Cattail	Typha latifolia
Rushes	Juncus spp.
Glasswort	Salicornia spp.
Spike-Grass	Distichlis spicata
Salt-Water Cordgrass	Spartina alterniflora
Salt-Meadow Grass	Spartina patens
Barnyard Grass	Echinochloa crusgalli
Reed Grass	Phragmites communis
Lombardy Poplar	Populus nigra italica
Rockweed	Ascophyllum nodosum
Rockweed	Fucus vesiculosus
Sea lettuce	Ulva lactuca
Green algae	Enteromorpha spp.

APPENDIX F

COMMON AND SCIENTIFIC NAMES OF WILDLIFE SPECIES

The Common and Scientific Names of Expected and Observed Wildlife Species of the Sales Creek Study Area

Common Name	Scientific Name
Muskrat	Ondatra zibethicus
Rats	*Rattus spp.
Eastern Cottontail	Sylvilagus floridanus
Canada Goose	Branta canadensis
Green-Winged Teal	Anas carolinensis
Mallard	Anas platyrhynchos
Black Duck	*Anas rubripes
Black-Backed Gull	*Larus marinus
Herring Gull	*Larus argentatus
Terns	*Sterna spp.
Snowy Egret	*Leucophoyx thula
Clapper Rail	Rallus longirostris
Black-bellied Plover	*Squatarola squatarola
Sandpipers	*Scolopacidae
Seaside Sparrow	Ammospiza maritima
Sharp-Tailed Sparrow	Ammospiza caudacuta
Curlews	*Numenius spp.
Bufflehead	*Bucephala albeola
Snowy Owl	Nyctea scandiaca
Greater Scaup	*Aythya marila
Lesser Scaup	*Aythya affinis
Double-crested Cormorant	*Phalacrocorax auritus
Robin	*Turdus migratorius
Starling	*Sturnus vulgaris
Common Crow	Corvus brachyrhynchos
Blue Jay	Cyanocitta cristata
Mourning Dove	Zenaidura macroura
Black-capped Chickadee	Parus atricapillus
House Wren	*Troglodytes aedon
Common Grackle	Quiscalus quiscalus
Red-winged Blackbird	*Agelaius phoeniceus
Pigeon	*Columba livia

*Wildlife observed in the study area.

APPENDIX G

RESULTS OF BIOLOGICAL SAMPLING

RGANISM	L/N	P	TOTAL #	NO./M^2	RELATIVE ABUNDANCE
IPTERA					
		TOTAL			
RICHOPTERA					
		TOTAL			
LECOPTERA					
		TOTAL			
PHEMEROPTERA					
		TOTAL			
ODONATA					
		TOTAL			
NEUROPTERA					
		TOTAL			
HEMIPTERA					
		TOTAL			
COLEOPTERA					
		TOTAL			

Total Freshwater Macroinvertebrates; Parts A and B

Total # of organisms 210 Total dry weight -

Total # of genera 2 Diversity index 0.33

Freshwater Macroinvertebrate Analysis

Part A

000120-06

STATION NUMBER:
1

COLLECTION LOCATION:
Sales Creek, Revere, MA

COLLECTED BY:
Carlton Noyes

DATE COLLECTED:
8/19/76

METHOD OF COLLECTION:
Surber

NUMBER OF GRABS:
4

SAMPLE AREA:
0.37m^2

IDENTIFIED BY:
Rebecca Longley

L = larvae
N = nymph
P = pupae
N.Q. = not quantitative

ORGANISM	TOTAL #	NO./M 2	RELATIVE ABUNDANCE %
CRUSTACEA			
TOTAL			
HIRUDINEA			
TOTAL			
NEMATODA			
TOTAL			
BIVALVIA			
TOTAL			
GASTROPODA			
Physa	12	32	5.6
TOTAL		32	5.6
OTHER			
Oligochaeta			
Limnodrilus	198	535	94.4
TOTAL		535	94.4

Freshwater Macroinvertebrate Analysis

Part B

REMARKS:

ORGANISM	L/N	P	TOTAL #	NO./M²	RELATIVE ABUNDANCE
DIPTERA					
		TOTAL			
TRICHOPTERA					
		TOTAL			
PLECOPTERA					
		TOTAL			
EPHEMEROPTERA					
		TOTAL			
ODONATA					
Erythemis		2	2	5	100.0
		TOTAL		5	100.0
NEUROPTERA					
		TOTAL			
HEMIPTERA					
		TOTAL			
COLEOPTERA					
		TOTAL			

Total Freshwater Macroinvertebrates; Parts A and B

Total # of organisms 5

Total dry weight -

Total # of genera 1

Diversity index 0.00

Freshwater Macroinvertebrate Analysis

Part A

000121-06

STATION NUMBER: 2

COLLECTION LOCATION: Sales Creek, Revere, MA

COLLECTED BY: Carlton Noyes

DATE COLLECTED: 8/19/76

METHOD OF COLLECTION: Surber

NUMBER OF GRABS: 4

SAMPLE AREA: 0.37m²

IDENTIFIED BY: Rebecca Longley

L = larvae
N = nymph
P = pupae
N.Q. = not quantitative

Freshwater Macroinvertebrate Analysis

Part B

ORGANISM	TOTAL #	NO./M ^{2}	RELATIVE ABUNDANCE %
CRUSTACEA			
TOTAL			
HIRUDINEA			
TOTAL			
NEMATODA			
TOTAL			
BIVALVIA			
TOTAL			
GASTROPODA			
TOTAL			
OTHER			
TOTAL			

REMARKS:

ORGANISM	L/N	P	TOTAL #	NO./M^2	RELATIVE ABUNDANCE
DIPTERA					
ironomus	5		5	13.5	100.0
	TOTAL			13.5	100.0
TRICHOPTERA					
	TOTAL				
PLECOPTERA					
	TOTAL				
EPHEMEROPTERA					
	TOTAL				
ODONATA					
	TOTAL				
NEUROPTERA					
	TOTAL				
HEMIPTERA					
	TOTAL				
COLEOPTERA					
	TOTAL				

Total Freshwater Macroinvertebrates; Parts A and B

Total # of organisms 5

Total dry weight -

Total # of genera 1

Diversity index 0.00

Freshwater Macroinvertebrate Analysis

Part A

000122-06

STATION NUMBER:
3

COLLECTION LOCATION:
Sales Creek, Revere, MA

COLLECTED BY:
Carlton Noyes

DATE COLLECTED:
8/19/76

METHOD OF COLLECTION:
Surber

NUMBER OF GRABS:
4

SAMPLE AREA:
0.37m^2

IDENTIFIED BY:
Rebecca Longley

L = larvae
N = nymph
P = pupae
N.Q. = not quantitative

Freshwater Macroinvertebrate Analysis

Part B

ORGANISM	TOTAL #	NO./M^2	RELATIVE ABUNDANCE %
CRUSTACEA			
TOTAL			
HIRUDINEA			
TOTAL			
NEMATODA			
TOTAL			
BIVALVIA			
TOTAL			
GASTROPODA			
TOTAL			
OTHER			
TOTAL			

REMARKS:

Freshwater Macroinvertebrate Analysis

Part A

000123-06

STATION NUMBER:
4

COLLECTION LOCATION:
Sales Creek, Revere, MA

COLLECTED BY:
Carlton Noyes

DATE COLLECTED:
8/19/76

METHOD OF COLLECTION:
Surber

NUMBER OF GRABS:
4

SAMPLE AREA:
$0.37 m^2$

IDENTIFIED BY:
Rebecca Longley

ORGANISM	L/N	P	TOTAL #	NO./M^2	RELATIVE ABUNDANCE
DIPTERA					
		TOTAL			
TRICHOPTERA					
		TOTAL			
PLECOPTERA					
		TOTAL			
EPHEMEROPTERA					
		TOTAL			
ODONATA					
		TOTAL			
NEUROPTERA					
		TOTAL			
HEMIPTERA					
		TOTAL			
COLEOPTERA					
		TOTAL			

L = larvae
N = nymph
P = pupae
N.Q. = not quantitative

Total Freshwater Macroinvertebrates; Parts A and B

Total # of organisms 4

Total dry weight -

Total # of genera 1

Diversity index 0.00

Freshwater Macroinvertebrate Analysis

Part B

ORGANISM	TOTAL #	NO./M ^{2}	RELATIVE ABUNDANCE %
CRUSTACEA			
TOTAL			
HIRUDINEA			
TOTAL			
NEMATODA			
TOTAL			
BIVALVIA			
TOTAL			
GASTROPODA			
TOTAL			
OTHER			
Oligochaeta			
Limnodrilus	4	10.8	100.0
TOTAL		10.8	100.0

REMARKS:

ANISM	L/I	A	TOTAL #	NO./M²	RELATIVE ABUNDANCE %
IFERA					
		TOTAL			
IDARIA					
ydrozoa					
yphozoa					
thozoa					
		TOTAL			
ENOPHORA					
		TOTAL			
ATYHELMINTHES					
		TOTAL			
MERTEA					
		TOTAL			
NELIDA					
irudinea					
ligochaeta					
rchiannelida					
olychaeta					
ereis succinea		107	107	669	56.0
olydora ciliata		5	5	31	2.6
		TOTAL		700	58.6
PUNCULOIDEA					
		TOTAL			

Marine Macroinvertebrate Analysis

Part A

000126-01

STATION NUMBER:
5

COLLECTION LOCATION:
Sales Creek, Revere, MA

COLLECTED BY:
Carlton Noyes

DATE COLLECTED:
8/25/76

METHOD OF COLLECTION:
Ponar (3 grab)

TOTALS: PARTS A,B,C,D

TOTAL NO. OF ORGANISMS:
191

TOTAL PHYLA:
3

TOTAL GENERA:
7

DIVERSITY INDEX:
1.64

TOTAL DRY WEIGHT:
-

IDENTIFIED BY:
Rebecca Longley

L = larvae
I = immature
A = adult
N.Q. = not quantitative

GANISM	L/I	A	TOTAL #	NO/ M2	RELATIVE ABUNDANCE %
LUSCA					
nphineura					
caphopoda					
astropoda					
assarius obsoletus		12	12	75	6.3
ivalvia					
odiolus demissus		1	1	6	0.5
ya arenaria		3	3	19	1.6
starte castanea		62	62	388	32.5
ephalopoda					
ther					
		TOTAL		488	40.9

Marine Macroinvertebrate Analysis

Part B

REMARKS:

L = larvae
I = immature
A = adult
N.Q. = not quantitative

Marine Macroinvertebrate Analysis

Part C

000126-01

STATION NUMBER:
5

COLLECTION LOCATION:
Sales Creek, Revere, MA

COLLECTED BY:
Carlton Noyes

DATE COLLECTED:
8/25/76

METHOD OF COLLECTION:
Ponar (3 grabs)

GANISM	L/I	A	TOTAL #	NO./M^2	RELATIVE ABUNDANCE %
THROPODA					
erostomata					
ycnogonida					
rustacea					
Mysidacea					
Cumacea					
Tanaidacea					
Isopoda					
yathura polita		1	1	6	0.5
Amphipoda					
Cirripedia					
Decapoda					
Hoplocarida					
			TOTAL	6	0.5

L = larvae
I = immature
A = adult
N.Q. = not quantitative

Marine Macroinvertebrate Analysis

Part D

RGANISM	L/I	A	TOTAL #	NO./ M^2	RELATIVE ABUNDANCE %
CTOPROCTA					
		TOTAL			
CHINODERMATA					
Asteroidea					
Holothuroidea					
Opiuroidea					
Echinoidea					
		TOTAL			
EMICHORDATA					
		TOTAL			
ROCHORDATA					
		TOTAL			
THER					
		TOTAL			

REMARKS:

L = larvae
I = immature
A = adult
N.Q. = not quantitative

Marine Macroinvertebrate Analysis
Part A

000127-01

STATION NUMBER:
6

COLLECTION LOCATION:
Sales Creek, Revere, MA

COLLECTED BY:
Carlton Noyes

DATE COLLECTED:
8/25/76

METHOD OF COLLECTION:
Ponar (1 grab)

TOTALS: PARTS A,B,C,D

TOTAL NO. OF ORGANISMS:
877

TOTAL PHYLA:
3

TOTAL GENERA:
7

DIVERSITY INDEX:
0.30

TOTAL DRY WEIGHT:
-

IDENTIFIED BY:
Rebecca Longley

L = larvae
I = immature
A = adult
N.Q. = not quantitative

Rebecca Longley

ANISM	L/I	A	TOTAL #	NO./M2	RELATIVE ABUNDANCE %
IFERA					
		TOTAL			
DARIA					
drozoa					
yphozoa					
thozoa					
		TOTAL			
NOPHORA					
		TOTAL			
TYHELMINTHES					
		TOTAL			
ERTEA					
		TOTAL			
NELIDA					
irudinea					
ligochaeta					
rchiannelida					
olychaeta					
coloplos acutus		7	7	132	0.9
ereis succinea		2	2	38	0.2
		TOTAL		170	1.1
PUNCULOIDEA					
		TOTAL			

ANISM	L/I	A	TOTAL #	NO/ M^2	RELATIVE ABUNDANCE %
LUSCA					
phineura					
aphopoda					
stropoda					
sarius obsoletus		3	3	57	0.3
ivalvia					
ya arenaria		1	1	19	0.1
emma gemma		1	1	19	0.1
starte castanea		852	852	16,103	97.2
ephalopoda					
ther					
		TOTAL		16,198	97.7

Marine Macroinvertebrate Analysis

Part B

REMARKS:

L = larvae
I = immature
A = adult
N.Q. = not quantitative

RGANISM	L/I	A	TOTAL #	NO./M^2	RELATIVE ABUNDANCE %
RTHROPODA					
Merostomata					
Pycnogonida					
Crustacea					
Mysidacea					
Cumacea					
Tanaidacea					
Isopoda					
Cyathura polita		11	11	208	1.2
Amphipoda					
Cirripedia					
Decapoda					
Hoplocarida					
		TOTAL		208	1.2

Marine Macroinvertebrate Analysis

Part C

000127-01

STATION NUMBER:
6

COLLECTION LOCATION:
Sales Creek, Revere, MA

COLLECTED BY:
Carlton Noyes

DATE COLLECTED:
8/25/76

METHOD OF COLLECTION:
Ponar (1 grab)

L = larvae
I = immature
A = adult
N.Q. = not quantitative

GANISM	L/I	A	TOTAL #	NO./ M^2	RELATIVE ABUNDANCE %
TOPROCTA					
		TOTAL			
CHINODERMATA					
Asteroidea					
Holothuroidea					
Opiuroidea					
Echinoidea					
		TOTAL			
EMICHORDATA					
		TOTAL			
ROCHORDATA					
		TOTAL			
THER					
		TOTAL			

Marine Macroinvertebrate Analysis

Part D

REMARKS:

L = larvae
I = immature
A = adult
N.Q. = not quantitative

Freshwater Macroinvertebrate Analysis

Part A

000176-06

STATION NUMBER: 7

COLLECTION LOCATION: Sales Creek, Revere, MA

COLLECTED BY: Carlton Noyes

DATE COLLECTED: 8/25/76

METHOD OF COLLECTION: Sieve

NUMBER OF GRABS: -

SAMPLE AREA: 0.09m² 0.09m²

IDENTIFIED BY: Carlton Noyes

RGANISM	L/N	P	TOTAL #	NO./M²	RELATIVE ABUNDANCE
IPTERA					
		TOTAL			
RICHOPTERA					
		TOTAL			
PLECOPTERA					
		TOTAL			
EPHEMEROPTERA					
		TOTAL			
ODONATA					
		TOTAL			
NEUROPTERA					
		TOTAL			
HEMIPTERA					
		TOTAL			
COLEOPTERA					
		TOTAL			

Total Freshwater Macroinvertebrates; Parts A and B

Total # of organisms ____________ Total dry weight -

Total # of genera 1 Diversity index 0.00

L = larvae
N = nymph
P = pupae
N.Q. = not quantitative

Freshwater Macroinvertebrate Analysis

Part B

ORGANISM	TOTAL #	NO./M 2	RELATIVE ABUNDANCE %
CRUSTACEA			
TOTAL			
HIRUDINEA			
TOTAL			
NEMATODA			
TOTAL			
BIVALVIA			
TOTAL			
GASTROPODA			
TOTAL			
OTHER			
Oligochaeta *Limnodrilus*	15	167	100.0
TOTAL		167	100.0

REMARKS:

APPENDIX H

ARCHAEOLOGIST REPORT

REPORT ON ARCHAEOLOGICAL SURVEY OF SALES AND GREEN CREEK AREA, REVERE, MASSACHUSETTS

Physical and Geological Background

Most of the topography of the Boston Harbor area is the result of the Wisconsin glaciation, which left deposits of till and outwash materials over the region. Drumlins, or rounded elongated hills of till, are especially characteristic of the Boston area, and several were formerly found near the survey area in Revere. Because of the world-wide lowering of sea levels that occured during the glacial period, the Boston shoreline was many kilometers further to the east until about 1000 BC, when shorelines stabilized in this region close to their present positions (Kaye and Barghoorn 1964). Until this stabilization of the shoreline occurred, the Revere area would have appeared as wooded hills and meadows.

Early maps of the Boston Harbor area indicate that what is now called the Belle Isle Inlet was then the eastern end of a narrow channel which separated Hog Island (also known as Hogg and Breed's Island) from the mainland (see Map 1). The northern part of this channel, running along the present Boston/ Revere city line, has been filled in and Hog Island is now a part of East Boston. Sales and Green's Creeks appear on these early maps as tributaries of Mill Creek or Chelsea Creek, which joins the Mystic River near its mouth and then empties into Boston Harbor. Work done in this area in 1932 by the Massachusetts Department of Public Works shifted the drainage of Sales and Green Creeks into Belle Isle Inlet, and filled in the old channel draining toward the west (Cristo report 1974).

Maps dating as early as the 17th century and as late as 1900 show that the area surrounding Sales and Green Creeks was saltmarsh. Subsurface soil

tests made by the Metropolitan District Commission in 1958 in the course of expansion of the Revere Beach Parkway found a clay or gravel substrate (presumably glacial deposits) overlain by 5 feet of loose grey sand, gravel, and sea shells (beach or estuary deposits?), which was overlain in turn by 13 to 14 feet of silty peat. This sequence confirms the marshy nature of the area in recent times, and is supported by additional testing done by the Division of Waterways on Suffolk Downs property. Here, 5 to 10 feet of miscellaneous fill was found to overlie at least 20 feet of peat deposits (Cristo report, 1974). Most of the area to be immediately affected by the proposed project is near or below the normal high tide level, and are quite understandably subject to chronic flooding.

Prehistoric Background

Man entered New England in the wake of the retreating glaciers, and the earliest known site in this immediate region is the Bull Brook site near Ipswich, dated around 9000 BC. Many prehistoric sites of more recent age have been found in this region, first representing people with a hunting, fishing, and gathering adaptation and later representing people who combined farming with other economic pursuits (Dincauze 1974). Boston Harbor may have been one of the richest areas in New England, with its abundant coastal, estuary, river, and land resources. The area seems to have supported a high population until decimating diseases were introduced by Europeans, and this population density is reflected in the wealth of prehistoric archaeological sites that have been found here. Unfortunately, most of these sites have been destroyed by the activities of the historic period.

With regard to Revere in particular, a number of burial sites have been found over the years along Revere Beach (Mass. Historical Commission site files and Dincauze 1974). A quotation from Shurtleff's History of the Town.

of Revere gives an indication of the density of prehistoric archaeological sites which existed here at one time and have since been lost.

> "...that the valley extending northward to Woodlawn Cemetery formerly abounded in Indian relics and other indications of Indian occupation, seems to point to these sites as near the dwelling place of the Sagamore. There are indications of an old Indian fort near a brook between Woodlawn and Sagamore Hill, another on the top of Mt. Revere, and still another on Powder Horn Hill. The cutting down of the hill at Crescent Beach near the end of Beach Street, laid open one of those Indian shell heaps which excite so much interest. Many arrow heads have been found near this heap and in various parts of the town, especially along the shore on the ridge at the foot of Shirley Avenue, where the boulevard now runs. Indian pipes and implements of war have been unearthed when digging in the streets and fields of the town. Indian skeletons were likewise found, and in June of 1881, two of them were unearthed from a gravel bank near the Pavilion. The remains of an old Indian burying ground were discovered on the Sewall estate, Revere Street, where now stands the Italian church; ...on May 30, 1891, the workmen engaged in excavating for a cellar on a lot at Revere Highlands, found a well-preserved skeleton, supposed to be that of an Indian. Several similar finds were previously made."(Shurtleff 1938: 22-23)

Historical Background

European fishermen, explorers, and traders visited the Boston area from the 16th century on, and first European settlement in the Harbor began in the 1620's. The area of the proposed project, part of "Rumney Marsh", became part of the city of Boston in 1634, at which time land was given out to 7 families who established farms there. Starting in 1739 the area became part of Chelsea. The major occupation was still farming, although 48 families now lived in Rumney Marsh. The area was called North Chelsea in 1846, and finally became Revere in 1871.(Shurtleff 1938) In the later part of the 19th century, the area changed character from primarily small farms to summer resorts and recreation facilities, focused on the beach. Extensive land filling took place in the 1930's, at which time Sales and Green Creeks were canalized into Belle Isle Inlet. Subsequently, highways, parking lots, stores, oil storage tanks, and the Suffolk Downs race track were constructed in the area. The area is now partly residential, partly recreational, and partly light industrial.

Survey Procedures

The survey procedure consisted of a search of existing records and literature relevant to the area under consideration, and a first-hand examination of the project area. The Massachusetts Historical Commission records were first checked to see if known sites existed in the project area. The closest sites listed were two on Revere Beach. The archaeological literature was was also checked, and no references to sites in this immediate area were found. A map of the region in 1739 (map 1) does indicate a house standing on the north bank of Sales Creek, but it is presumably overlain by the houses still standing along this bank, which will not be adversely affected by the proposed project. The rest of this area was not inhabited until the area was filled in the 20th century.

The next step in the survey procedure was to walk over the area of the intended project, observing the soil surface and testing with a soil coring device for sub-surface indications of cultural remains. Most of the area to be affected was under water at the time of the survey, and this is apparently normal. These areas could obviously not be tested, so survey was confined to the banks of the creeks and canals. I was also unable to test in the many areas where the project land consists of culverts beneath highways and the MBTA tracks. Also, no testing was done within the Suffolk Downs race track, since races were in progress. These are all areas of extensive disturbance or land filling, and it is felt that no cultural resources were missed in these untested areas. The area just to the north of Sales Creek east of North Shore Drive (map 2) could not be tested thoroughly because it is broken into inhabited house lots, whose back lawns run right down to the creek. Systematic checking with the soil coring devices was done along areas where vacant lots allowed access to the creek bank, and in a few cases where residents granted permission for me to check their back yards.

In places of access to the project area, the soil was tested with the

soil coring devices every ten meters or so, with the expectation that this spacing would probably find all but very small sites. No test pits were excavated because no part of the project area appeared to warrent them on the basis of topography or other indications that sites might exist. Several local residents were consulted, and none had encountered artifacts in the course of gardening or other activities.

Findings

No historic or prehistoric archaeological sites were found in this area in the course of the literature search or the on-site search. This lack of cultural resources is due to several factors. 1) Although historic and prehistoric people lived in this area, they did not live immediately in the marshes or estuaries, but rather chose to live next to them. Previous surveys of similar areas suggest that sites will be found on rising ground next to salt marshes or beaches, but not in marshes (Luedtke 1975). Most of the project area is now or was in the recent past under water or marsh. Even the residential area north of Sales Creek shows the grey-brown mud resulting from the frequent flooding of this area. 2) Much of the project area has been filled to make it habitable, and a thick layer of dark coarse soils with much crushed rock, bits of construction materials, chunks of asphalt, bits of rusting metal, and pieces of china and glass covers the area. Most of the land south of Sales Creek and on both sides of Green Creek appears to be filled. This obscures any sites under a thick layer of refuse, although as mentioned earlier, testing has shown that the fill rests on marsh. 3) There has been a great deal of disturbance in this area associated with previous construction and canalization. The one part of the project area that was not previously marsh or estuary, the narrow projection parallel to Revere Beach, lies next to the MBTA tracks. Any sites that existed there have been destroyed by that construction.

There are certainly paleobotanical resources here, in the form of plants and pollen in the peaty sediments of the marsh, but these resources are duplicated in many places in the Boston area. Such resources are also found in far less disturbed condition elsewhere.

Summary and Recommendations

No important prehistoric, historic, or paleobotanical resources were found in the area that would be impacted by the projected Sales Creek Flood Control Project. The lack of cultural resources is attributed to the fact that nearly all the area is either under the high tide level or has been severely disturbed by previous construction in the area.

However, Boston, like other coastal areas, presents special problems with regard to the identification of some prehistoric resources. Due to the post-glacial rise in sea level and the intentional filling of some low areas to make them habitable, some resources are deeply buried. The Boylston Street Fishweir, one of the most important prehistoric sites in New England, was found 30 feet below the present ground surface in the course of excavations for subways and the foundations of the old Hancock Building(Johnson 1942). No environmental impact study would have found that site, and similar sites could exist in other Boston area wetlands. This puts an added responsibility on contractors who may encounter such sites.

It is not suggested that work crews need to become archaeologists, but they should be warned that they might encounter cultural remains while digging, and that if they do, Chapter 1155 of the State Law requires that they report such finds to the State Archaeologist. Many such remains are easily recognizable. Human bones, layers or concentrations of charcoal, stone arrow points or other tools, layers of shellfish and animal bones, and sometimes even wooden stakes may be found in marshy soils. Nearly any archaeologist will be willing to respond immediately to such discoveries when they occur

in the course of construction, and he or whe will try to recover important data as quickly as possible so that work can proceed.

In summary, no cultural resources were found, but work crews should be alerted to the possibility that they might exist at great depths below the present ground surface.

List of References

Cristo, Andrew Engineers
1974 Report on Flood Control Study, Sales Creek, Revere, Mass. Report Submitted to Department of Environmental Quality Engineering, Division of Waterways.

Des Barres, J.F.W.
1775 A Chart of the Harbour of Boston

Dincauze, Dena F.
1974 An introduction to archaeology in the greater Boston area. Archaeology of Eastern North America 2:1: 39-67.

Johnson, F.
1942 The Boylston Street Fishweir. Papers of the R.S. Peabody Foundation for Archaeology vol. 2.

Kaye, C.A. and E.S. Barghoorn
1964 Late Quaternary Sea-level change and crustal rise at Boston, Massachusetts, with notes on the autocompaction of peat. Bulletin of the Geological Society of America vol. 75:63-80.

Luedtke, Barbara E.
1975 Final report on the archaeological and paleobotanical resources of twelve islands in Boston Harbor. Report submitted to Massachusetts Department of Natural Resources.

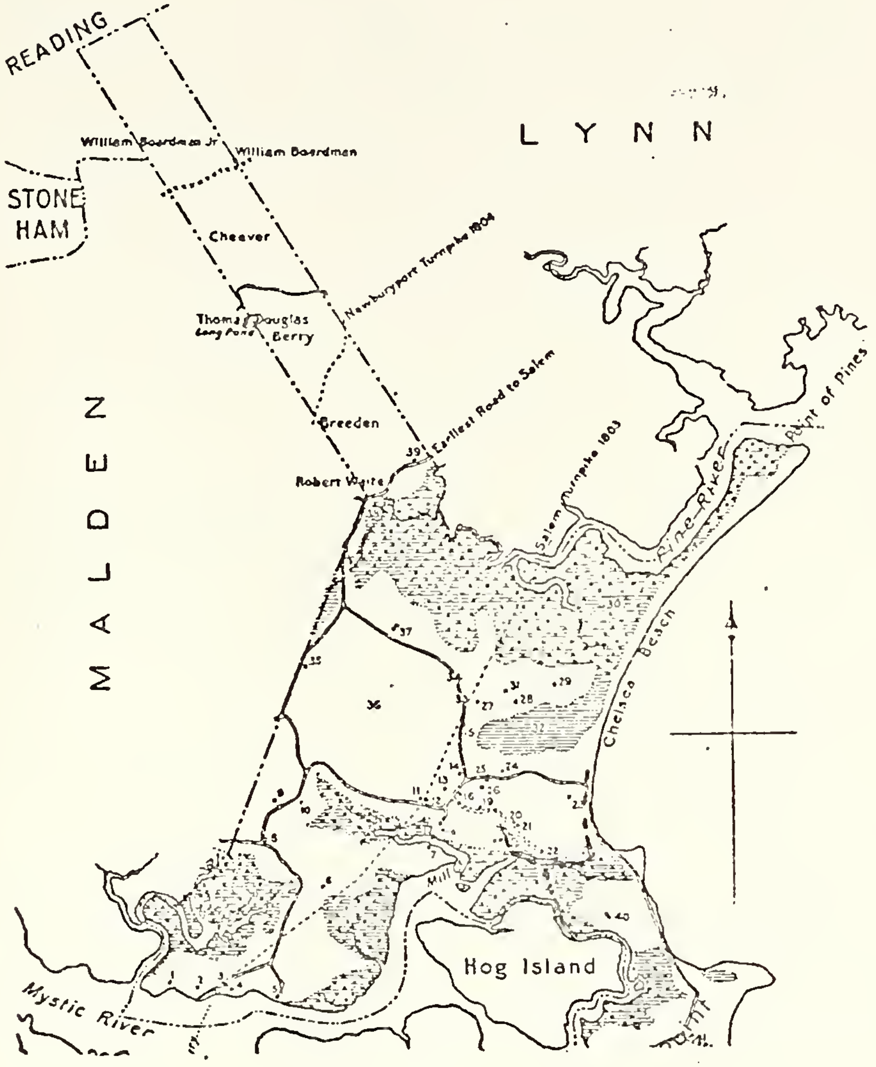
Massachusetts Historical Commission site files

Metropolitan Area Planning Council
1972 Boston Harbor Islands Comprehensive Plan.

Miscellaneous residents of Sales Creek area

Shurtleff, Benjamin
1938 The History of the Town of Revere. Beckler Press, Boston.

Map 1

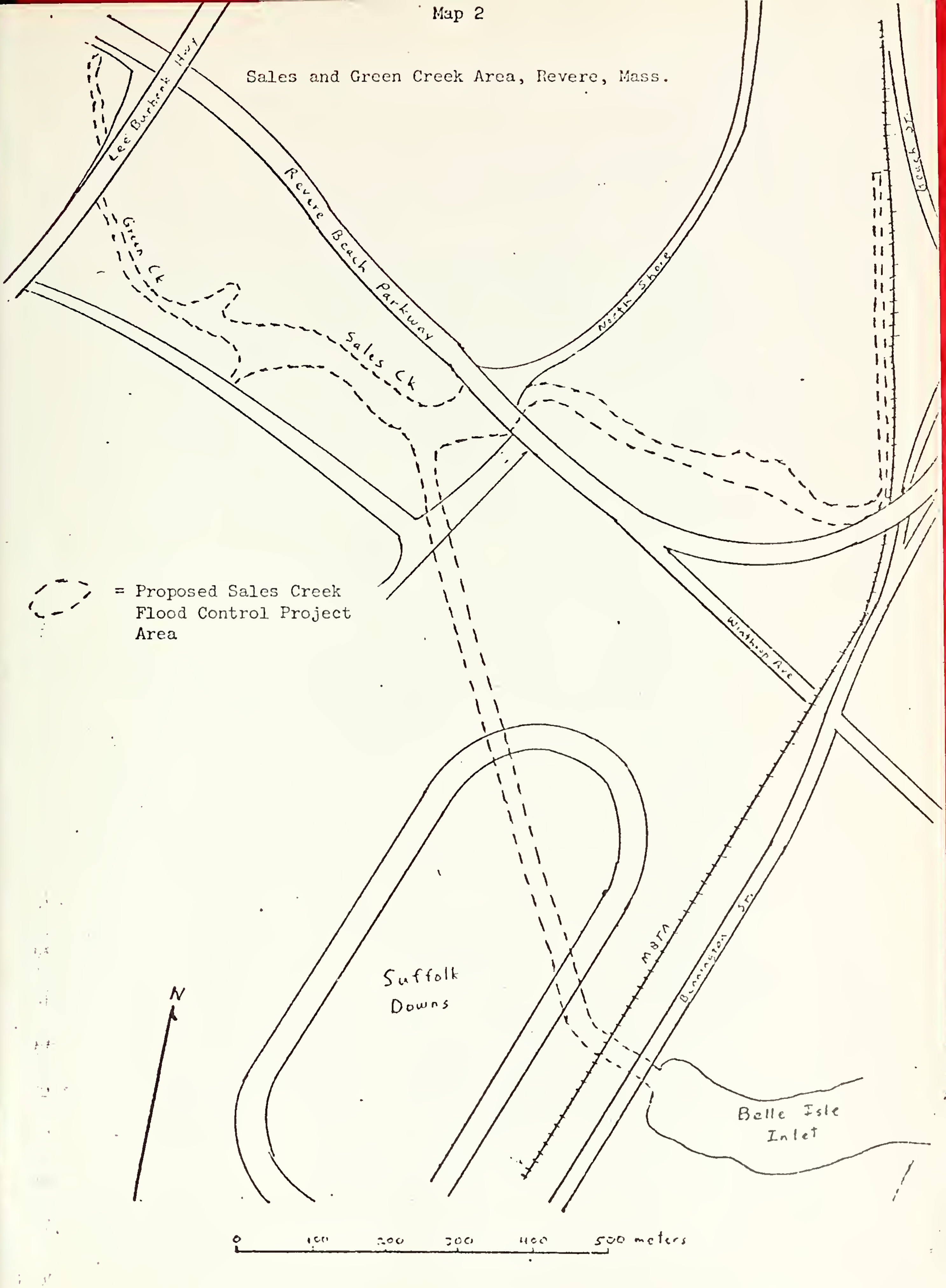


Location Of Buildings In 1739
By courtesy of Massachusetts Historical Society

from Shurtleff 1938:111. ---- = project area

Map 2

Sales and Green Creek Area, Revere, Mass.



= Proposed Sales Creek Flood Control Project Area